400 Societal Concerns in Civil Engineering (2)
Prereq: senior. (fall) Engineering economy, codes, variances, alternative designs, and public meetings.

410 Applied Property Surveying (3)
Prereq: 210. (spring) Triangulation, astronomical observations, land surveying, instrument adjustments, special topics. 2 lec, 3 lab.

415 Geodetic Surveying (3)
Prereq: 210 or perm. (winter) Astronomical observations, photogrammetry and geodetic methods used in GPS and photogrammetry to establish horizontal and vertical control for objects. 3 lec.

416 Construction Estimating (3)
Methods used to elaborate construction estimates, to prepare and understand the components of a bid, and conduct manual and computer-aided takeoff and pricing.

423 Continuum Mechanics (4)
Prereq: perm. (winter) Matrix methods in mechanics and structures; laws of dynamics; mechanical properties of solids and fluids; basic theories of continuum mechanics. Grad course open to selected undergrads. 4 lec.

424 Strength of Materials II (3)
Prereq: C or better in 222. (fall) Unsymmetrical bending, shear centers, columns, energy, and continuation of basic topics usually taught in Strength of Materials I. 3 lec.

427 Experimental Stress Analysis (3)
Prereq: 424. (spring) Experimental methods of stress determination including photoelasticity, stress coat, and electric strain gauge techniques; stress analyses; strain rosettes for combined stress determination. Grad course open to selected undergrads. 2 lec.

431 Experimental Methods in Structural Dynamics (3)
Prereq: permission. (spring) Use of computer-aided structural models to identify their vibration characteristics. Frequency response functions using dual-channel signal analyzers. Dynamic measurement techniques. Modal parameter extraction techniques. Computer-aided structural dynamics. Grad course open to selected undergrads. 2 lec, 3 lab.

432 Structural Design in Concrete (4)
Prereq: C or better in 330. (winter) Materials and properties; design methods, strength of rectangular sections subject to bending moments, axial loads, and combined loads; theory of failure or in combination; continuity in concrete construction; design of one-way slabs; design of T-sections in bending; deflection calculations; footing design. 4 lec.

433 Structural Design in Steel (4)
Prereq: C or better in 330. (spring) Materials and properties; design methods, design of tension members; structural fasteners; design of compression members, beams, trusses, and frames. 4 lec.

434 Advanced Structural Design (3)
Prereq: 432 or 433, or perm. (spring) Design of complete structures or major components of structures. 3 lec.

437 Timber Design (3)

438 Prestressed Concrete Design (3)

439 Computer-Aided Structural Design (3)
Prereq: 330, 432, or perm. Analysis and design of complete structural systems constructed from reinforced concrete, structural steel, and/or other applicable materials by using computers. Material reports and cost estimation of projects. 1 lec, 4 lab.

445 Flow Routing (3)
Prereq: 342 or perm. (winter) Gradually varied flow computation, the use of computer software programs for flow routing, and their engineering applications.

450 Water Treatment (3)
Prereq: 342, 343, CHEM 123. (fall) Sources and collection of public water supplies; principles of treatment processes. 3 lec.

451 Wastewater Treatment (3)
Prereq: 342, 343, CHEM 123. (winter) Quantities and collection of municipal wastewater; principles of treatment processes. 3 lec.

452 Water and Wastewater Analysis (3)
Prereq: CHEM 123. (fall) Lab methods and interpretation of results of chemical and bacteriological examination of water and wastewater. 2 lec, 3 lab.

453 Solid/Hazardous Waste Management (3)
Prereq: CHEM 123. (fall) An advanced study of engineering principles to chemical processing systems to reduce or eliminate discharges which have a negative impact on environmental systems; investigations into green building practices and sustainability including use of novel or recycled materials, energy management and efficiency, water use/re-use, and indoor air quality.

454 Green Engineering (3)
Prereq: sr, perm. (fall) Identification, classification, and study of techniques to minimize the impact of products during their life cycle, handling, treating, and disposing of solid/hazardous wastes regulated under federal and state guidelines and legislation.

457 Water Resources Engineering (3)
Prereq: 343 or perm. (winter) Elective Civil Engineering course designed to provide integrated treatment of water resources engineering, including hydrological measurements, runoff, groundwater, water law, reservoir design, frequency analysis, planning, flood control. Systems approach to multi-purpose water resource projects emphasizing design. 3 lec.

458 Water Quality Engineering (3)
Prereq: perm. (demand) Natural and man-made characteristics of water quality, changes in quality resulting from use, criteria for control of stream pollution, methods of improving water quality, also legal, economic, and institutional aspects. Grad course open to selected undergrads. 3 lec.

462 Traffic Engineering (3)
Prereq: 361; major or perm. (winter) Traffic parameters, traffic data collection, capacity analysis of freeways, signalized intersection design. 3 lec.

471 Foundation Engineering (3)
Prereq: 370. (fall) Design and construction problems in soil engineering; field and laboratory investigations; foundation selection and design criteria; principles of design of shallow and deep foundations; site improvement. 3 lec.

474 Soil Mechanics Laboratory (1)
Prereq: perm. (spring) Advanced techniques for measurement of soil engineering properties. Grad course open to selected undergrads. 3 lab.

476 Soil Stabilization (4)
Engineering, geological, and pedological soil classification systems. Mineralogy of clay minerals and clays/water systems; requirements for and factors affecting soil stability. Methods and mechanics of soil stabilization; designing and testing stabilized soils. 3 lec., 1 lab.

482 Paving Materials and Mixtures (3)
Prereq: perm. (fall) Types, constituents, chemical behavior, tests, specifications, and uses of bituminous materials, Portland cements, and aggregates in pavements. Design and manufacture of paving mixtures and construction of pavements. Grad course open to selected undergrads. 2 lec, 3 lab.

483 Principles of Pavement Design (3)
Prereq: perm. (spring) Fundamentals of wheel loads and stresses in pavements. Properties in pavement components and design tests. Design methods and evaluations. 3 lec.

490 Special Investigations (1–5)
Prereq: perm. Special investigations or problems not covered by formal courses. Permits well-qualified student to pursue individual study under direction of faculty member.

491A Senior Design—Land Development (4)
Prereq: 343, 361, or perm. (fall) An advanced applied engineering course utilizing multiple fundamental civil engineering courses as applied to land development.

491B Senior Design—Environmental/Water Resources (4)
Prereq: 450, with 451 or perm. (winter) An advanced course utilizing civil engineering courses covering combinations of water/wastewater treatment and hydraulic/hydrology courses as applied to society’s needs.

491C Senior Design—Structures and Foundations (4)
Prereq: 370 and 432 or 433, or perm. (spring) A civil engineering design elective integrating fundamental civil engineering courses for foundation and structural design, analysis, and drawing.

491D Senior Design—Special Project (4)
Prereq: sr and perm. An advanced applied engineering course integrating several major disciplines of civil engineering in a design project.

499 CE Undergraduate Research Experience (3)
Prereq: perm. (fall, winter, spring) Students participate in an independent and original laboratory research project under the close supervision of a faculty advisor. This entails familiarity with relevant civil engineering literature, laboratory work, preparation of a report, and presentation of a departmental seminar.

**Engineering, Electrical (EE) 101**

Introduction to Electrical Engineering (4) (2A)
Prereq: MATH 113 or placement level 2. (fall, winter) The goal of this course is to introduce students to the profession of electrical engineering. Students will develop a knowledge of key technical concepts of electricity: voltage, current, resistance, and power. In addition, students will study the history, professional values, and methods of electrical engineering. Lab work provides hands-on experience with electrical systems. 3 lec, 2 lab.

102 Introduction to Computer Engineering (4)
Prereq: MATH 113 or placement level 2. (fall, winter) The goal of this course is to introduce students to the field of computer engineering. Students will develop a knowledge of the fundamentals of Boolean algebra, binary arithmetic, characteristics of logic gates, and flip-flops. Lab work provides hands-on experience with digital systems. 3 lec, 2 lab.

103 Introduction to Electrical and Computer Engineering Design (4)
Prereq: EE 101, 102, and CS 210, or 240A, or ET 181. (fall, spring) The goal of this course is to introduce students to the field of electrical engineering. Students will develop an understanding of engineering design principles. Students will also develop a knowledge of microcomputer organization and an ability to perform assembly language programming. Lab work provides students an opportunity to apply design principles on a major project. 3 lec, 2 lab.

210 Foundations of Electrical and Computer Engineering I (4)
Prereq: 101 and MATH 263A, (fall, winter) Basic concepts and definitions, units, DC circuit analysis, Kirchhoff’s laws, source transformations, nodal and mesh analysis, network theorems, induction and capacitance, and simple RC and RL circuits with an emphasis on developing problem-solving skills. Students will be expected to and able to demonstrate, a firm “understanding” of these topics as well as a mastery of basic problem-solving skills. In addition, there will be an emphasis on being able to make an effective technical presentation.

211 Foundations of Electrical and Computer Engineering II (4)
Prereq: C or better in 210 and MATH 263B. (fall, winter, spring) Continuation of 210. RC and RL circuits, Laplace Transforms, State-Variables, Fourier Analysis, AC circuit analysis, and the frequency domain, with an emphasis on strengthening problem-solving skills. Students will be expected to
have, and to demonstrate, a thorough understand-
ing of the frequency domain and how DC circuits, transient circuits, Fourier circuits, and AC circuits can be presented in the domain. They will also need to demonstrate a mastery of advanced problem-solving skills. In addition, students will need to have sufficiently communicated, in written form, advanced technical concepts and problems.

212 Foundations of Electrical and Computer Engineering III (4)
Prereq: 103, 211, 221. (fall, spring) Advanced AC circuits, pulse waveforms, magnetically coupled circuits, frequency response and filters, two-port circuits, and simple electronic circuits. Students will need to have, and demonstrate, a thorough understanding of the basic fundamentals of electronic and computer engineering and how they relate to more advanced subjects, such as those covered in this course. They will also need to demonstrate a facility with advanced problem-solving techniques. There will be a design project to be performed in the laboratory. 3lec, 2lab.

221 Instrumentation Laboratory (4)
Prereq: 210, with 211. (winter, spring) Designed to give students a proficiency in using electrical instruments. Emphasis will be on learning how to use instruments, using good experimental technique, and knowing the limitations of various laboratory equipment. Emphasis will also be placed on the proper acquisition, recording, analysis, and reporting of data. Format will include classroom instruction and laboratory work. 2lec, 4lab.

224 Introduction to Digital Circuits and Computer Design (4)
Prereq: 210, 221, (spring) Basic Microprocessor components, information representation, analysis and synthesis of combinational and sequential circuits, data paths, pipelining, control units, instruction sequencing and interpretations, instruction set architectures and FPGAs.

304 Basic Electrical Laboratory I (1)
Prereq: 313 or with 313. Lab supplement to 313. Basic instruments and circuit measurements. Not open for credit to electrical engineering majors.

305 Basic Electrical Laboratory II (1)
Prereq: 304 and/or with 314. Lab supplement to 314. Operation of semiconductor devices, amplifier design, oscillators and digital circuits design. Not open for credit to electrical engineering majors.

313 Basic Electrical Engineering I (3)

314 Basic Electrical Engineering II (3)
Prereq: 313. (winter) Semiconductor devices, small signal analysis, amplifiers and oscillator circuits, pulse and digital circuits. Not open for credit to electrical engineering majors.

315 Basic Electrical Engineering III (3)
Prereq: 313. (spring) Transformers, direct current machines, polyphase induction and synchronous, rotating machines, including equivalent circuits and steady state performance prediction. Not open for credit to electrical engineering majors.

321 Electromagnetics and Materials I (4)
Prereq: 102, MATH 440. (winter, spring) Designed to develop in students an understanding of Maxwell's equations through an overview of properties of materials, electrostatics, magnetostatics and electrodynamics, and magnetostatics and electrodynamics.

322 Electromagnetics and Materials II (5)
Prereq: 321. (fall) Continuation of 321. Discussion of time-varying, varying electromagnetic fields. Application of field theory to solution of problems from various branches of electrical engineering with emphasis upon physical interpretation, include- ed are relation of field theory to circuit theory, Poiting's theorem, stored energy and power flow, controllable and power flow, TEM waves, uniform plane wave, wave reflection and refraction. Theory and applications of transmission lines.

333 Intermediate Electrical Engineering I (4)
Prereq: 211. (fall, winter) Develop an understanding of the relationship between signals and systems. Includes a continuation of the Laplace and Fourier analysis started in EE 211 and modeling of high-order electrical and mechanical systems. Frequency response, Bode plots, and systems design using poles and zeros will be addressed, as well as state space representations and control analysis. Students will also develop an awareness of discrete time systems, difference equations, Z transforms, sampling, and digital filters.

334 Intermediate Electrical Engineering II (4)
Prereq: 212, 333. (winter, spring) Develop an understanding of the relationship between electronic devices including diodes, bipolar transistors, and FETs. Students will also develop an awareness of semiconductor properties and operation in this knowledge to design analog circuits. Course includes computer-aided analysis and design.

335 Energy Conversion (5)
Prereq: 321. (fall) Basic principles of electromechanical energy conversion. Circuit models and parama-
ter tests for single-phase and 3-phase transformers. Fundamentals of DC machinery; circuit models and characteristics of DC motors. Fundamentals of AC machinery; theory and operation of synchronous machines and induction motors.

351 Intermediate Computer Engineering I (4)
Prereq: 212, 224. (fall, winter) Fundamental knowledge and skills for the study and practice of computer engineering. An assembly language study of computer instruction set architectures and FPGAs. Not open for credit to computer engineering majors.

352 Intermediate Computer Engineering II (4)
Prereq: 351, 371. (winter, spring) Theoretical framework for information processing, including content location, and transmitting discrete and continuous-time signals and data by digital systems and computers. A continuation of EE 351.

371 Applied Probability and Statistics for Electrical Engineers (4)
Prereq: 212, or MATH 263D with CS 361. (fall, spring). Fundamentals of statistics and probability and the ability to apply them to problems in electrical engineering.

395A Intermediate Electrical and Computer Engineering Design Experience (4)
Prereq: 102 and 211. (winter, junior standing) Enhancement of the laboratory skills of students and to reinforce an understanding of the fundamentals of theory for the execution of successful experimentation. Students will develop a greater awareness of specific topics in electronics, system, energy conversion devices, power distribution, communications, and electromagnetics. 2lec, 4lab.

395B Intermediate Electrical and Computer Engineering Design Experience (4)
Prereq: 395A. Continuation of EE 395A. 1lec, 6lab.

395C Intermediate Electrical and Computer Engineering Design Experience (4)
Prereq: 395B. Continuation of EE 395B. 8lab.

401 Advanced Laboratory I (1)
Prereq: perm. (fall, winter, spring) Advanced lab format follows EE 211 for each lab. Student-proposed projects are design- or research-oriented and directed by faculty member specializing in area of interest. Portion of this lab required in conjunction with certain electrical engineering 400-level lecture courses.

402 Advanced Laboratory II (1)
Prereq: perm. (fall, winter, spring) See 401 for description.

403 Library Research (1)
Prereq: perm. (fall, winter, spring) Library research under the supervision of a faculty member. Prior approval required. See departmental office for regulations.

405 Physical Electronics (3)
Prereq: 334. (fall) Simplified 1-dimensional band theory of solids. Valence and conduction band occupancy from Fermi-Dirac statistics. Hole con-
duction and doping. Derivation of PN junction volt-amp-temperature characteristic. DC and AC characteristics of junction transistors derived from fundamentals.

406 Advanced Analog Circuits (3)
Prereq: 334. (spring, on demand) Advanced analog circuitry. Operational amplifiers, characteristics, limitations. Linear and nonlinear applications. Feedback, stability criteria, compensation, time, and frequency response. Waveform generation of shaping, timing, comparison, and arithmetic operations.

407 Advanced Digital Circuits (3)

410 Semiconductor Principles I (3)
Prereq: 405. (spring, on demand) Continuation of 405. Application of semiconductor theory to solid state devices: diodes, transistors, FETs and Gunn effect devices. Charge control analysis, Ebers-Moll equations; electro-optical effects.

414 VHDL Design (4)
Prereq: 102 (fall) Application of very high speed hardware description language (VHDL) for digital design, simulation, verification, and specification. Structural design concepts, design tools. VHDL process, data, types, control statements, concurrent statements, functions, and procedures. VHDL modeling techniques, simulations, and VHDL, RTL, and state level designs. Design synthesis. 3lec, 2lab.

415 VLSI Design (3)
Prereq: 334. (winter) Introduction to very large scale integration (VLSI) technology and design of CMOS integrated circuits. VLSI fabrication and design, rules, logic design, performance estimation, VLSI, and VLSI design. Students may register for 2 hours for senior lab (401, 402) credit for the VLSI lab work. 3lec, 2lab.

416 VLSI Design II (4)
Prereq: 415. (spring) System design, clock generation and clocking disciplines, design validation, sequential testing, standard cell layout, adders, ALUs, multipliers, high-density memory, PLA design, floorplanning, OIL architecture, register transfer design, data-path control, high-level synthesis. 3lec, 2lab.

425 Control Theory I (3)

426 Control Theory II (3)
Prereq: 425. (spring) Simulation, Bode plots, frequency response performance specifications and relationship to time domain specifications, Nyquist criterion, relative stability measures, closed loop frequency response, analytical design of lead, lag, lag-lead, and PI/PID compensators.

427 Control Theory III (3)
Prereq: 426. Sampling and data reconstruction, discrete-time systems, Z transforms, sampled data systems, frequency response, Nyquist criterion, root locus, bilinear transformation, analytical design of lead, lag, lag-lead, and PID compensators.

428 State Variable Methods in Control (3)
Prereq: 425, on demand) Advanced methods for solving linear time-invariant systems. State variable concepts, writing state equations, time-domain solution of the state equation and the matrix exponential, relations to transfer functions, controllability and observability, state variable methods of design including state feedback and state estimation.

429 Mechanics and Control of Robotic Manipulators (4)
Prereq: sr. (spring) Classification and applications for mechanical manipulators; geometric and manipulator dynamics equations. Trajectory generation and control schemes including sensory feedback. Lab
exercises to augment lecture material. Co-listed with ME 342.

431 Optoelectronics and Photonics I (3)  
Prereq: 321. (fall) Introduction to important modern optical devices and lasers and their applications. Examines electromagnetic theory needed to understand lasers, their construction, and their applications. Detailed discussion of various types of lasers and their characterization.

432 Optoelectronics and Photonics II (3)  

433 Optoelectronic Materials and Devices (3)  
Prereq: 405. Introduction to modern optical materials and devices utilizing semiconductor technology; optical integration of these devices and their application in diverse fields. Fundamentals of materials and devices emphasized.

440 Microwave Theory and Devices (3)  
Prereq: 322. (Offered every spring) Wave propagation, transmission lines, Smith chart, impedance matching, waveguides, and survey of devices (microwave generators, semiconductor devices, etc.).

441 Antennas (3)  
Prereq: 322. (winter) Fundamental concepts and definitions, radiation, wave polarization, isotropic and point sources, linear wire antennas, loops, arrays, and personal computer applications.

443 Electromagnetics I (3)  
Prereq: 322. (Offered every winter.) Mathematical review of vector operations in Cartesian and curvilinear coordinates. Solution of wave equations in Cartesian coordinates and application to wave reflection from interfaces between general media. Decomposition of wave solutions into TE, TM, and TEM waves, with application to circular waveguide, radiation from line sources, and scattering from cylindrical objects.

454 Power Electronics (3)  
Prereq: 334. (winter) Introduces senior to power electronics, solid-state circuits, and potential devices for the conversion and control of electric power. Emphasis on AC to DC and DC to AC conversion, and DC and AC motor drives. Semiconductor device characteristics (particularly those characterized in 340 and 341) and device protection conclude the offering.

455 Introduction to Electric Power System Engineering and Analysis I (3)  
Prereq: 335. (fall) Includes power system representation, computer methods, symmetrical components, protection methods, and stability.

456 Introduction to Electric Power System Engineering and Analysis II (3)  
Prereq: 455. (winter) Continuation of 455. See 455 for description.

457 Introduction to Electric Power System Engineering and Analysis III (3)  

461 Digital Systems I (3)  
Prereq: 352. (winter) Postulates and fundamental theorems of Boolean algebra; algebraic and map methods for design of combinational logic and simple sequential logic; boolean minimization methods; introduction to system design using shift registers, counters, etc.

462 Digital Systems II (3)  
Prereq: 461. (spring) Basic concepts from theory of finite-state machines, analysis and synthesis of sequential circuits, study of state assignment, synchronous and asynchronous machines, and system design using integrated circuits.

463 Digital Systems III (3)  
Prereq: 462. (spring) Synthesis of sequential circuits using ROMs and RAMs for control logic. Introduction to computer organization and design including selection of instruction set, register and bus organization and implementation of control logic with microprogrammed control.

467 Advanced Microprocessors (3)  
Prereq: 367. (winter) Organization of 16- and 32-bit microprocessors and attention given to a specific microprocessor family (such as the Motorola 68000) including instruction set, assembly language programming, arithmetic operations, I/O, etc.

468 Microcomputers II (3)  
Prereq: 467. (fall or spring) Design, implementation, and application of microcontroller or microprocessor based systems. Microcontroller instruction set architectures (e.g. PIC Micro). Fault-tolerant systems and other topics include but are not limited to hardware interface to external components, serial and parallel input/output (I/O), networks of microcontrollers and embedded microprocessors (e.g. CAN, USB, TCP/IP, Ethernet), motor and actuator control. Computer projects emphasize the design and implementation microcontroller-based systems.

470 Communication Engineering (3)  
Prereq: 333. (fall) Unified approach to communications stressing topics common to all transmission systems. Review of Fourier series. Fourier integral and complex frequency techniques with emphasis on communication networks, time response, and measurement of information, amplitude modulation (double and single sideband techniques), frequency modulation, sampling theory, and digital communications systems, fundamentals of random signal theory and its application to communication systems, noise and its effect on conventional modulation systems; noise figure, noise suppression techniques, and other related topics.

471 Stochastic Processes in Electrical Engineering (3)  
Prereq: 371. (winter) Brief review of probability concepts, including random variables, moments, etc. Random process fundamentals (ensembles and realizations), stationarity concepts, 2nd-order statistics, Gaussian processes, optimal random signal through linear systems, Markov chains.

472 Introduction to Digital Communications (3)  

473 Digital Signal Processing (3)  
Prereq: 333, 371. (on demand) Discrete time signals and systems review, convolution, discrete-time Fourier transform, z-transform, canonical filter representations, windowing, and FFT.

481 Professional Experience in Electrical Engineering (1)  
Prereq: 470 and perm. Supervised work project. Directed work-study program in an electrical engineering profession, established in industrial environment. Credit dependent on advancement and mutual agreement between faculty supervisor and participating company. May be repeated; however, hours applied toward graduation limited by department.

485 Electronic Navigation Systems I (3)  
Prereq: 321, 333. (winter) Principles and theory of operation of electronic navigation systems with emphasis on avionics, aircraft instrumentation, VOR, DME, Inertial, Omega, LORAN, ILS, MLS, Transit, GPS, air traffic control, and radar.

486 Electronic Navigation Systems II (3)  

487 Electronic Navigation Systems III (3)  
Prereq: 486. Continuation of 485 and 486 with emphasis on mathematical modeling of navigation and landing systems, fault tolerant avionics system design and architectures, and flight testing and current developments.

490 Selected Topics (1–6)  
Prereq: perm. Selected topics of current interest in electrical engineering.

495A Electrical and Computer Engineering Capstone Design I (4)  
Prereq: 495B. (fall) Continuation of 495A. Students are expected to complete the design developed in EE 495B with an emphasis on final assembly, testing, and analysis of outcomes. They will conduct a formal design review. In addition, the student will be exposed to a variety of career options available to graduates. 1 or 2 lab.

495C Electrical and Computer Engineering Capstone Design III (4)  
Prereq: 495B. Continuation of EE 495B. Students are expected to complete the design developed in EE 495B with an emphasis on final assembly, testing, and analysis of outcomes. They will conduct a formal design review. In addition, the student will be exposed to a variety of career options available to graduates. 1 or 2 lab.

499C Selected Topics (1–6)  
Prereq: 499B. Continuation of 499B. Students are expected to complete the design begun in EE 499B with an emphasis on construction, pretesting, and redesign. They will conduct a critical design review. In addition, students will study and develop skills necessary for a successful engineering career. 1 or 2 lab.

500 Introduction to Computers and Industrial Engineering (4)  
Prereq: 310, 315, 317. (fall, spring) Provides knowledge of the economic consequences of engineering decision processes, and methods for evaluation of engineering design alternatives in terms of costs and benefits. Topics include time value of money, annual cost method, present worth method, rate of return method, depreciation, benefit/cost, break-even analysis, income taxes, equipment replacement and trade-ins.

505 Engineering Statistics I (4)  
Prereq: MATH 315C. (fall, winter) Introductory statistics. Emphasis on data collection and analysis. Application of basic statistical tests, techniques, and experimental design concepts to engineering and science data problem areas. Not for IE undergraduate majors.

506 Engineering Statistics II (4)  
Prereq: 305. MATH 211 or concurrent. (fall) Functions of random variables, sampling distributions, estimation theory, hypothesis testing, and statistical prediction.

530 Work Design (5)  
Prereq: 200, 305, IT 101. (spring, summer) Design of work systems and measurement of work. Emphasis includes job methods, operation analysis, charting techniques and schematic models, stop-watch time study, work sampling, predetermined time standards, incentive wage plans, and learning curves. 4 or 2 lab.

581 Internship in Industrial and Systems Engineering (1–3)  
Prereq: jr. Supervised work-program study, in industrial and systems engineering profession, in established industrial or government environment.
Courses / Engineering

Credit dependent upon advance registration and mutual agreement between faculty supervisor and participating company. Course may be repeated; however, hours applied for graduation limited by dept.

402 Manufacturing Systems (4)
Prereq: sr in ENT. (Winter) Applications of industrial and systems engineering techniques, principles, practices, and methodologies as they relate to the operation, analysis, management, planning, and design of manufacturing systems.

403 Material Handling and Systems Engineering (4)
Prereq: 333 or sr in ENT. (Winter) Provides a broad understanding of materials handling engineering from a systems design and application engineering point of view. Instruction in the engineering principles, design criteria, operating parameters, performance requirements, equipment resources, and applications of engineering practices involved in the planning, design, and operation of materials handling systems for manufacturing, physical distribution, and government operations. A materials handling system design project is a required part of the course.

407 Introduction to Designed Experiments (3)
Prereq: 304 or 306 or equiv. (Spring) Design and analysis of engineering experiments approached from the statistical model point of view. Block design, full and fractional factorial design, analysis of variance, and introduction to response surface methodology. Software for statistical analysis is utilized.

415 Introduction to Systems Engineering (3)
Prereq: 305, MATH 240, ET 181. Introduction to systems engineering concepts. Continuous time and discrete time methods for modeling of systems. Systems structure, open-loop and closed-loop systems, positive and negative feedback. State and transition equations. Applications to modeling in manufacturing, production and inventory systems, service industries, physical and biological systems.

417 Analytical Foundations of Industrial and Systems Engineering (3)

426 Microprocessor Applications in Manufacturing (4)

432 Inventory and Manufacturing Control I (4)
Prereq: 305. (Winter, Spring) Design of inventory and manufacturing control systems. Forecasting, continuous and periodic review inventories, inventory systems, and design and period review inventory systems. Relationship between production schedules and inventory. MRP. Production scheduling systems, sequencing models, dispatching rules. 4 lec.

433 Industrial Computer Simulation (4)
Prereq: 306, ET 181. (Fall) Simulation of industrial engineering systems using discrete event modeling, process modeling approach to simulation. Basic (entities, processes, and resources), Intermediate (queues, seize, and release), and advanced (entity transport) modeling concepts. Statistical analysis of simulation results. Animation of simulation models. Applications of simulation in manufacturing, production, and service. Lab projects using simulation software. 3 lec., 2 lab.

435 Quality Control and Reliability (3)
Prereq: 304 or 306. (Winter) Application of statistics to control of quality and reliability in products and processes. Design of acceptance sampling and process control systems, including attention to inspection and test methods. Design and implementation of quality assurance programs, including nonstatistical dimension of quality systems. 3 lec.

436 Project Management (3)
(fall) Development and utilization of network

Engineering, Mechanical (ME)

100 Introduction to Mechanical Engineering (4)
(fall, winter) Basic application of principles of all majors. Introduction to the history, professional values, and methods of mechanical engineering. Lab work provides hands-on experience with engineering systems and introduces engineering design, graphical, and computer techniques of problem solving. Discussion of current areas of interest for engineering research and introduces students to the technology. No specific mathematics back-ground required.

224 Dynamics (4)
Prereq: PHYS 251, C or better in CE 220. (Fall, Winter, Spring) Motion of particles and rigid bodies, work and energy, impulse and momentum. 4 lec.

301 Kinematics and Dynamics of Machines (4)
Prereq: C or better in 222. (Winter) Analytical and graphical solutions of motion problems involving mechanical elements: linkages, gears, cams, mechanical trains, etc.

313 Metal Processing (3)
Prereq: CE 222, CHE 331. (Spring) Structure of metals, mechanics of metal forming and metal cutting. Analysis of forces, energy requirements, and temperature effects. Interrelationship between metal processing and mechanical properties.

321 Introduction to Thermodynamics (4)
Prereq: PHYS 252, MATH 263C. (Fall, Winter, Spring) Basic engineering thermodynamics. Definitions, first law, properties and property relations, second law, availability, and applications to engineering problems.

328 Applied Thermodynamics (4)
Prereq: C or better in 321. (Winter) Nonreactive and reactive mixtures, turbomachinery, analytical studies of gas and vapor power cycles, and refrigeration. 4 lec.

350 Introduction to CAD (3)

398 Junior Laboratory (3)
Prereq: EE 304. (Fall, Winter, Spring) Introduction to measurement of various phenomena frequently encountered in mechanical engineering, e.g., strain, temperature, pressure, flow rate, displacement, and acceleration. Emphasis given to interpretation of data and preparation of laboratory reports.

400 Heating, Ventilation, and Air Conditioning (3)
Prereq: jix/j, ET 240, (Fall) Design and evaluation of heating, air conditioning, and total-energy systems employed to provide thermal environments for buildings ranging in scope from residences to integrated commercial, apartment, or industrial complexes. Covers human comfort, psychometrics, load analysis, techniques, equipment, and controls.

401 System Analysis and Control (4)
Prereq: MATH 340. (Spring) Modeling and formulation of physical systems. Transient and steady-state dynamic responses, and other fundamental theory of automatic controls and applications. 3 lec., 1 lab.

403 Machine Design I (4)
Prereq: CHE 331, C or better in CE 222, (Spring) Applications of mechanics, mechanisms, materials, and mechanical processes to design and selection of machine members and units of power transmission.

404 Machine Design II (4)
Prereq: 403. (On Demand) Morphology of engineering design. Applications of statistics and probability and techniques of optimization to design. Team design project.

406 Analysis and Design of Mechanisms (4)
Prereq: 424. (on demand) Applications of basic performance analysis to basic design. Radioactive materials. 3 lec.

425 Propulsion Systems Analysis (3)
Prereq: 328 and 412. (on demand) Fuels, principles of combustion, boilers, grates, stokers, furnaces, coal pulverizers, economizers, preheaters, superheaters, stacks, forced and induced draft, boiler-feed pumps, heat balances, and hydro power. 3 lec.

427 Power Station Engineering (3)
Prereq: 328 and 412. (on demand) Fuels, principles of combustion, boilers, grates, stokers, furnaces, coal pulverizers, economizers, preheaters, superheaters, stacks, forced and induced draft, boiler-feed pumps, heat balances, and hydro power. 3 lec.

429 Advanced Engineering Dynamics (3)
Prereq: 224. (on demand) Theoretical analysis and application of dynamical aspects and problems of machines and systems.

430 Conduction and Radiation Heat Transfer (3)
Prereq: 412. (on demand) Advanced analytical treatment of conduction and radiation heat transfer. Boundary value problems, orthogonal expansions, moving heat sources, multi-dimensional problems with time varying boundary conditions. Conduction analysis, conformal transformations, radiation network matrix analysis, diffus-rex-exepular transport, and Monte Carlo techniques, etc.

431 Atmospheric Pollution Control (4)
Prereq: CHE 307, or ME 321 and CE 340, or perm. (on demand) Sources of emissions from major industries, internal combustion engines, and other sources. Techniques for the prediction of particulate and gaseous pollutants in atmosphere and at their source. Current techniques and future possibilities for control of air pollution. Bases for air pollution legislation.

434 Fundamentals of Aerosol Behavior (4)
Prereq: 328 or 412. (on demand) Aerosol characterization transport properties, convective and inertial deposition, light scattering, and visibility, experimental methods, coagulation, gas to particle conversion, general dynamic equation for aerosols.

435 Energy Engineering and Management (3)
(on demand) Basic concepts and objectives of energy management, energy audit, engineering evaluation of several energy systems, availability analysis, second law efficiency, economic evaluation, and application of these principles to case studies.

436 Direct Energy Conversion (4)
(on demand) General principles of unconventional energy conversion. Thermoelectricity, thermionics, MHD, fuel cells, photovoltaics, wind systems, solar systems, and energy storage.

437 Solar Design (3)
Prereq: CHE 307, or ME 321 and CE 340, or perm. (on demand) Introduction to theoretical principles and practical design aspects of solar energy systems. Topics covered include principles of radiation, heat transfer, load computation, air and liquid, flat-plate collector; contaminants, concentrating collectors; energy storage; photovoltaic conversion; economic analysis.

438 Conduction and Radiation Heat Transfer (3)
Prereq: 412. (on demand) Advanced analytical treatment of conduction and radiation heat transfer. Boundary value problems, orthogonal expansions, moving heat sources, multi-dimensional problems with time varying boundary conditions. Conduction analysis, conformal transformations, radiation network matrix analysis, diffus-rex-exepular transport, and Monte Carlo techniques, etc.

439 Mechanic Behavior of Materials (3)

440 Solar Design (3)
Prereq: 328 or 412. (on demand) Introduction to theoretical principles and practical design aspects of solar energy systems. Topics covered include principles of radiation, heat transfer, load computation, air and liquid, flat-plate collector; concentrating collectors; energy storage; photovoltaic conversion; economic analysis.

441 Colloquium (1)
Prereq: sr. (on demand) Open presentation of individual engineering analysis or design effort. Requires demonstration of individual analytical or design ability, knowledge of engineering fundamentals (including passing a mini-fundamentals of engineering test), and satisfactory oral presentation techniques.

442 Projects in Thermal Machinery (3)

443 Mechanical Behavior and Metallurgy of Materials (4)
Prereq: CHE 331, or (on demand) Relationship of mechanical properties to internal structure, i.e., both microstructure and macrostructure. Micromechanical strengthening mechanisms of metals and alloys. Elastic and plastic behavior. Fatigue, fracture, and creep behaviors and mechanisms. Single crystal deformation and dislocation theory. Ductile and brittle materials testing. Plastic forming of metals. Quantitative microscopy.

444 Mechanical Behavior and Metallurgy of Materials (4)
Prereq: CHE 331, or (on demand) Relationship of mechanical properties to internal structure, i.e., both microstructure and macrostructure. Micromechanical strengthening mechanisms of metals and alloys. Elastic and plastic behavior. Fatigue, fracture, and creep behaviors and mechanisms. Single crystal deformation and dislocation theory. Ductile and brittle materials testing. Plastic forming of metals. Quantitative microscopy.

445 Design for Manufacture (4)
Prereq: 328, 403, (fall) This course is the first of a three course sequence that will provide a comprehensive, capstone, senior design experience for mechanical engineering majors. Course includes studies in the theoretical techniques of design, as well as the design, construction, and evaluation of the performance of an actual engineering system. ME 470, 471, and 472 must be taken consecutively. 2 lec, 2 lab.

446 Design for Manufacture (4)
Prereq: sr. (on demand) Open presentation of individual engineering analysis or design effort. Requires demonstration of individual analytical or design ability, knowledge of engineering fundamentals (including passing a mini-fundamentals of engineering test), and satisfactory oral presentation techniques.
491 Mechanical Vibrations I (4)
Prereq: C or better in 224, MATH 340, ET 240, sr. (fall) Characteristic phenomena of mechanical vibration encountered in machines and structures (of 1 degree of freedom) and their quantitative inves-
tigation. Simple harmonic motion; free, transient, and forced vibrations; and damping effects.

492 Mechanical Vibrations II (4)
Prereq: C or better in 491, (spring) Application of matrix methods; 2 degrees of freedom systems; lumped mass systems with several degrees of freedom, and methods for normal mode determi-
nation. 4 lec.

493 Lubrication and Bearing Analysis (3) (on demand) Concepts of boundary, hydrostatic, and dynamic lubrication. McKee, and Raimondi methods. Solid lubrication, por-
ous bearings, and gas bearings.

494 Advanced Machine Design (3) (on demand) Advanced considerations in design and analysis of machine members, strength under combined stress, thermal stress, fatigue in metals, and design using plastics. 3 lec.

495 Introduction to Kinetic Theory and Statistical Thermodynamics (4) (on demand) Kinetic theory, classical and quantum statistical mechanics with applications to engineering devices. 3 lec.

496 Experimental Methods in Design (3) (Prereq: 403, (on demand) Investigation and evaluation of experimental methods that may be used to obtain design and performance data. Techniques of photo-elasticity, strain测量s, and vibration measurement.

497 Methods of Engineering Analysis I (4)
Prereq: MATH 340, (on demand) Applications of matrices, Fourier series, partial differential equations, and Bessel functions.

498 Senior Laboratory (3)
Prereq: 398, 412, 403 or concurrent. (fall, winter, spring) Modern engineering experiments. Measurement of the behavior of more complex systems encountered in mechanical engineering. Equal emphasis given to mechanical systems and to thermal and fluid systems. Engines, vibrating systems, wind-tunnel experiments, refrigeration systems, fatigue, multidimensional stresses, and combustion are typical subjects for investigation.

499 Senior Design Project (4)
Prereq: 404 or 417, and perm. (fall, winter, spring) Capstone design project in mechanical engineering. Self directed or group project which requires typical design activities such as decision-making, feasibility evaluation, technical analysis, performance summary, technical report preparation, and oral technical presentation. Projects may be individually arranged with a faculty member in mechanical engineering or a group project (current examples are the Mini Baja Vehicle Contest or the Walking Robot Contest). Subject matter can be mechanisms, thermal/fluid systems, control systems, etc. Oral final presenta-
tion to senior class and panel of faculty required.

Engineering and Technology (ET)

181 Computer Methods in Engineering I (4)
Prereq: MATH 263A or 163A, preference given to EN or pre-engineering majors. Introduction to application of digital computation for solution of engineering problems, with emphasis on methodology and organization. Problem formulation and solution in terms of an objective programming approach using the C++ language in an interactive network environment.

190 Cooperative Education Field Experience I (1)
Prereq: perm. Required of, and limited to, stu-
dents on approved co-op work assignments. Prior approval required before a student registers. Credit earned is not applicable toward specific degree requirements, but will accumulate in the student’s academic credit total. In addition to continual monitoring of student’s progress by the cooperative education coordinator and the faculty advisor, participating students are required to submit a final report of their activities.

240 Computer Methods in Engineering II (4)
Prereq: ET 181, CS 210, CS 230, or CS 240A, and MATH 340 or equivalent channels. Introduction to application of digital computation techniques to engineering problems involving applied numerical methods. Study and use of the MATLAB programming language as an analytical tool.

280 Engineering and Technology—Overview (4) (2A)
Intended for students of all majors; non-Engineer-
ing Technology students are encouraged. Provides an overview of engineering and technology, to place the first course in a historical context, to examine the views of supporters and detractors, to examine moral and ethical issues associated with the profession in society, and to develop an appreciation for the manner in which engineering and technological work is conducted. Emphasizes a “problem-solving” approach to questions of all kinds, but more specifically to technological ones.

290 Cooperative Education Field Experience II (1)
Prereq: perm. See 190.

320 History of Western Technology (3) (on demand) Survey of significant technological innovations of Western civilization from Greco-Roman period into 20th century. Interrelationships, in history, between technology and society. Background in technology or science not required.

322 Introduction to Materials Behavior (3)
Introductory materials science course covering behavior of metals, polymers, and ceramics for nonotechnical majors.

325 Pollution Solutions I (3)
Prereq: jr or perm, not open to civil engineering majors. Designed for students with limited technical background who are interested in problems of water pollution. Deals with nature of water, source and character of pollution, methods of control and pollution control. 3 lec.

334 Water Pollution Control (3)
Prereq: soph, non-engineering students. Designed for student with limited technical background but who is interested in problems of water pollution. Deals with nature of water, source and character of pollutants, technology of wastewater renovation, ecology of water pollution, and legal, economic, and administrative constraints.

337 Transportation Today (3)
Prereq: jr or perm, not open to civil engineering majors. Designed for student with limited technical back-
ground who are interested in gaining knowledge in area of highway and transportation planning and design. Major topics include geometric factors, traffic analysis, modes of transportation, human environment, and planning strategies.

350 Engineering and the Technological Society (3) (2A)
Prereq: jr or sr. Technical inventions and social inventions, impact and social consequences of engineering public policy issues, ethical consider-
ations, and participation in alternative futures. Discussion and lecture format.

390 Cooperative Education Field Experience III (1)
Prereq: perm. See 190.

495 Leadership Seminar (4)
Prereq: ET major, perm. Through selected read-
ings, class presentations, discussions, and case studies, students will seek an understanding of leadership and its importance and effectiveness in achieving goals with followers. Successful leaders from engineering and other fields will visit the class and share their knowledge of leadership. Several written reports and oral presentations on leader-
sip case studies will be required during the term.

English (ENG)

150 Developmental Writing Skills (4)
Prereq: placement or recommendation. Credit for 150 will not be given to any student who has already passed any other English course. Develops writing skills through attention to coherence, mechanics, syntax, and writing conventions. Does not satisfy Tier I or Arts and Sciences Humanities requirements. (Nonnative speakers take 150A.)

151 Writing and Rhetoric I (5) (1E)
Prereq: fr or soph only; 150, or 151 placement into or earlier quarter or into 152/3. Prac-
tice in composing and revising expository essays which are well organized, logically coherent, and effective for their purpose and audience. Topics from personal experience or nonfiction reading. (Nonnative speakers take 151A.)

152 Writing and Reading (5) (1E)
Prereq: fr and soph only. Same as 151 except that topics are developed from reading and discussion of fiction, poetry, and/or drama.

153 Writing and Reading: Special Topics (5) (1E)
Prereq: fr and soph only. Similar in structure, genres, and purposes to 152, but each section uses readings and/or clips focused on a specific theme chosen by the instructor. Recent themes include the environment, the Viet-Nam war, the social outsider, The Brothers Karamzov and popular culture.

153A Writing and Reading: Gender (5) (1E)
Prereq: fr and soph only. Same as 152 except that topics are developed from reading and discussing gender roles of women and men in literature. Students examine and write about how, in both literature and life, men and women see themselves and each other, how people learn what society expects of them, and about such topics as sexuality, marriage, friendship, and rebellion against culturally imposed sexual roles.

153B Writing and Reading: African American Experience (5) (1E)
Prereq: fr and soph only. Same as 152 except that topics are developed from reading and examining various experiences of African Americans in America, from earliest writings to and empha-
"ising contemporary literature, including fiction, poems, essays, and autobiographies.

200 Introduction to Literature (4) (2H)
Prereq: 151 or 152 or 153 or 153A/1B. Approaches to reading and interpreting fiction, poetry, and
drama using skills, techniques, and language of interpretation. Intended for nonmajors.

201 Critical Approaches to Fiction (4)
Course text analysis of fiction, development of critical vocabulary, and introduction to the variety of current methods of responding to literature. Intended for nonmajors.

202 Critical Approaches to Poetry (4)
Course text analysis of poetry, development of critical vocabulary, and introduction to the variety of current methods of responding to literature. Intended for nonmajors.

203 Critical Approaches to Drama (4)
Course text analysis of drama, development of critical vocabulary, and introduction to the variety of current methods of responding to literature. Intended for nonmajors.

203A Interpretation of Drama (Film) (4)
Prereq: 151 or 152 or 153 or 153A/B. Critical study of film and literature, e.g., film adaptations of literary classics, films made by literary authors, etc. May not be taken to fulfill major requirement of two courses from 201, 202, 203.

204 Introduction to International Literature I: The Classical Tradition (4) (2H)
Prereq: only for 199. Texts which exemplify the classical sensibility in Western literature.

205 Introduction to International Literature II: Romantic Tradition (4) (2H)
Prereq: one course above 199. British, American, and Continental texts which exemplify the Romantic tradition in Western literature.

206 Introduction to International Literature III: The Modern Traditions (4)
Prereq: one course above 199. Texts which express the modern sensibility in Western literature.

210 Critical Approaches to Popular Literature (4)
Prereq: one course above 150. Introduction to techniques and criticism in works where serious and popular literature meet, e.g., mysteries, science fiction, westerns.

250 Principles of Textual Analysis (4)
Offers undergraduates considering the English major a thorough grounding in textual analysis and critical terminology. Emphasis on general reading strategies rather than investigation of a particular topic.

251 English Lit. to 1688 (5)
Prereq: 250 or concurrent. This course will survey some of the major authors, genres, and movements of the early British period, from the Anglo-Saxons to the Glorious Revolution in the 17th century. The course will include some of the most influential literary figures of the period, but will also give attention to less canonical writers who have attracted increasing scholarly attention in recent years.

252 English Lit. 1689-Present (5)
Prereq: 250 or concurrent. This course will survey some of the major authors, genres, and literary movements of the modern British period, from the Glorious Revolution to the 20th century. The course will include some of the most influential literary figures of the period, and will also give attention to less canonical writers who have attracted increasing scholarly attention in recent years.

253 Survey of American Lit. (5)
Prereq: 250 or concurrent. This course will survey some of the major authors, genres, and movements in American literature, from the early colonial period to the 20th century. The course will include some of the most influential literary figures in American literature, and will also give attention to less canonical writers who have attracted increasing scholarly attention in recent years.

254 Research and Writing in English Studies (4)
Prereq: 151-2-3; 250 or conc.; not 207I. This course prepares students to use scholarly resources to write critical analyses of texts in English Studies. Students are required to master research methods, library resources, the integration of primary and secondary texts, MLA/Chicago documentation, and the conventions of critical writing. Readings for the course vary, and may include a single long text or several short ones. Students do extensive outside research on the texts they choose to write at least 20 pages of critical prose based on this research, revise this writing, and make presentations to the class about their work.

270 Special Studies: Individual or Comparative Authors (2-3)
Prereq: one course above 150. Intensive study of individual or comparative authors: (A) Medieval, (B) Renaissance, (C) Restoration and 18th-century, (D) 19th-century American, (E) 19th-century British, (F) 20th-century American, (G) 20th-century British, (H) Continental.

271 Special Studies: Selected Themes or Topics in Literature (2-3)
Prereq: one course above 150. Intensive study of selected themes or topics in literature: (A) drama, (B) fiction, (D) comparative genres, (E) language, (F) stylistics and rhetoric, (G) literature and film, (H) gay and lesbian, (I) man and books.

277T English Tutorial (1-10)
Prereq: approval from Department of English tutorial director; and arts and sciences major. Fall quarter, first year.

278T English Tutorial (1-10)
Prereq: approval from Department of English tutorial director; and arts and sciences major. Winter quarter, first year.

280 Expository Writing and the Research Paper (4)
Prereq: one course above 150. Practice in library research, techniques of documentation, and writing research papers.

297T English Tutorial (1-15)
Prereq: HTC student. Fall quarter, first-year course in two-year tutorial sequence.

298T English Tutorial (1-15)
Prereq: HTC student. Winter quarter, first-year course in two-year tutorial sequence.

299T English Tutorial (1-15)
Prereq: HTC student. Spring quarter, first-year course in two-year tutorial sequence.

301 Shakespeare: The Histories (4)
Prereq: 251 or jr or sr.

302 Shakespeare: The Comedies (4)
Prereq: 251 or jr or sr.

303 Shakespeare: The Tragedies (4)
Prereq: 251 or jr or sr.

304 English Bible (4)
Prereq: one course above 150. Selected prose and poetry of the Hebrew and Christian scriptures.

305J Technical Writing (4) (1J)
Prereq: jr and completion of first-year composition. Preparing clear, functional reports; presenting data for experts and other specialized audiences. Documents include, but are not limited to, proposals; information reports (progress, feasibility, inspection, completion); and descriptions of mechanisms and technical processes.

306J Women and Writing (4) (1J)
Prereq: jr and completion of first-year composition. Practice in developing essays on women and their interests, on women and writing, and on gender issues.

307J Writing and Research in English Studies (4) (1J)
Prereq: jr or sr; two courses from 201, 202, 203. Scholarly writing in English studies: research reports, integration of primary and secondary texts, library resources, and MLA/Chicago documentation.

308J Writing and Rhetoric I (4) (1J)
Prereq: jr or sr; completion of first-year composition; and permission of instructor. The primary purpose of this course is to provide students in the sciences with an opportunity to practice writing within their majors. The course focuses on how to review prior research, how to conduct research projects, how to incorporate research results into final reports, and how to write clearly and concisely.

311 English Literature to 1500 (4)
Prereq: 251, authors, works, and genres of Old and Middle English literature.

312 English Literature: 1500–1660 (4)
Prereq: 251, authors, works, and genres of Renaissance English literature.

313 English Literature: 1660–1800 (4)
Prereq: 252, authors, works, and genres of Restoration and 18th-century English literature.

314 English Literature: 1800–1900 (4)
Prereq: 252. Authors, works, and genres of Romantic and Victorian English literature.

315 English Literature: 1900 to Present (4)
Prereq: 252. Authors, works, and genres of British literature from 1900 to the present.

321 American Literature to 1865 (4)
Prereq: 253. Authors, works, and genres of American literature from the colonial period through the Civil War.

322 American Literature: 1865–1918 (4)
Prereq: 253. Authors, works, and genres of American literature from the end of the Civil War to the end of World War I.

323 American Literature: 1918 to Present (4)
Prereq: 253. Authors, works, and genres of American literature from the end of World War I to the present.

325 Women and Literature (4)
Prereq: one course above 199 and jr or sr. Surveys work of significant women writers.

326 Lesbian and Gay Literature (4)
Prereq: one course above English 150. Surveys lesbian, gay, bisexual, and transgendered (LGBT) literature with an emphasis on how LGBT identities and experiences have been represented in post-1980 literary discourse.

327 African American Fiction (4)
Prereq: one course above 150. A selection of major fiction by African American authors.

328 African American Poetry (4)
Prereq: one course above 150. A selection of major poetry by African American authors.

329 African American Drama (4)
Prereq: one course above 150. A chronological survey of major drama by African American authors.

331 Studies in Asian Literature (4) (2C)
(fall) Introduction to cultural background of Asian literature.

332 Studies in Asian Literature (4) (2C)
(winter) Continuation of 331. Study of classical Asian literature.

333 Studies in Asian Literature (4) (2C)
(spring) Continuation of 332. Study of modern Asian literature.

335 The Ohio University Writers (4)
Faculty writers at OU visit classrooms to read and discuss their work.

336 McGuffey Lectureship in Literature (1–4)
Prereq: one course above 150. Special series of lectures by current McGuffey Visiting Professor of English. Lectures offered determine credit hrs assigned.

342 English and Continental Literature (4)
Prereq: one course above 150. Authors, themes, and genres in English and European literature.

349 History of Books and Printing (4)
Prereq: one course above 150. Introduction to history of the book and its place in development of Western culture from ancient world to present. Approach is primarily historical, cultural, and aesthetic.
Courses / English

350 Traditional Grammar, Mechanics, and Usage (4)
Prereq: one course above 150. Grammatical understanding and awareness of relationships in sentence structure, usage, and punctuation.

351 The History of the English Language (4)
Prereq: jr or sr. Course examines changes affecting English; sound patterns, grammatical forms, vocabulary, and semantic values.

352 The Development of American English (4)
Prereq: jr or sr. Regional and social varieties of American English.

353 The Structure of American English (4)
Prereq: jr or sr. Study of English grammar using a linguistic model chosen from contemporary linguistics.

356 Young Adult Literature (4)
Prereq: 250. Historical development, and philosophical and aesthetic bases of literature for young adults.

361 Creative Writing: Fiction (4)
Prereq: 200 or 201 or 250. Beginning course in writing fiction with emphasis on invention, craft, and criticism of student writing and published fiction.

362 Creative Writing: Poetry (4)
Prereq: 200 or 202 or 250. Beginning course in writing poetry with emphasis on invention, craft, and criticism of student writing and published poetry.

363 Creative Writing: Nonfiction (4)
Prereq: 200 or 201 or 250. Beginning course in writing nonfiction with emphasis on invention, craft, and criticism of student writing and published nonfiction.

377T English Tutorial (1–10)
Prereq: approval from Department of English tutorial director; arts and sciences major. Spring quarter, first year.

378T English Tutorial (1–10)
Prereq: approval from Department of English tutorial director; arts and sciences major. Fall quarter, second year.

393 Creative Writing Workshop: Short Story (4)
Prereq: 361. Instruction and practice in fiction writing, concentrating on narrative, character, and setting.

394 Creative Writing Workshop: Poetry (4)
Prereq: 362. Instruction and practice in poetry writing.

395 Creative Writing Workshop: Nonfiction (4)
Prereq: 363. Instruction and practice in writing nonfiction prose, with attention to fictionalized biography and literary essays.

397T English Tutorial (1–15)
Prereq: HTC student. Fall quarter, second-year course in two-year tutorial sequence.

398T English Tutorial (1–15)
Prereq: HTC student. Winter quarter, second-year course in two-year tutorial sequence.

399 Literary Theory (4)
Prereq: 250, 301–303, 310–323. Recent issues in literary theory and the study of literary texts.

399T English Tutorial (1–15)
Prereq: HTC student. Spring quarter, second-year course in two-year tutorial sequence.

430 American Literature (3)
Prereq: enrollment in Inst. Amer. Cult. Modern and contemporary American literature as part of the annual summer Institute in American Culture for Austrian Students and Teachers.

441 Colloquium (4)
Prereq: sr. (fall) Specific interdisciplinary problems to be assigned each quarter.

442 Colloquium (4)
Prereq: sr. (winter)

443 Colloquium (4)
Prereq: sr. (spring)

444 Special Studies (4)
Prereq: sr.

447 Studies in Criticism (4)
Prereq: sr. Problems in critical theory.

451 Teaching Language and Composition (3)
Prereq: sr. Advanced standing in professional education. Content and methods of presentation for teaching language and composition in high school. Not applicable to Arts and Sciences 200-level requirement.

451L Field Experience in Secondary English/Language and Composition (1)
Prereq: sr; concurrent with 451L. Field experience to provide practical applications of materials, methods, and techniques of language and composition instruction as appropriate in various secondary school settings. Students will observe classroom teachers and carry out various instructional tasks as the cooperating teachers deem appropriate.

452 Teaching Language (3)
Prereq: sr. Advanced standing in professional education. Content and methods of presentation for teaching language in high school. Not applicable to Arts and Sciences 200-level requirement.

452L Field Experience in Secondary English Language (1)
Prereq: sr; concurrent with 452L. Field experience to provide practical applications of materials, methods, and techniques of literature instruction as appropriate in various secondary school settings. Students will observe classroom teachers and carry out various instructional tasks as the cooperating teachers deem appropriate.

453 Studies in World Literature (4)
Prereq: 399. Examines contemporary world literature with an emphasis on non-Western texts (i.e., Asian, African, Latin American, Eastern European, etc.) to let students explore various cultural voices. Involves greater cultural diversity through close analysis of texts. Addresses current literary discussions on decolonization, the postcolonial condition, eurocentrism, displacement, and multiculturalism. Intended for students in secondary education program.

455 English Education Workshop (1–5)
Prereq: teaching certificate or eqv., or perm. Studies in principles, approaches, and issues in teaching English from elementary school to post-secondary. Topics vary.

456 Readings in Children's Literature (4)
Prereq: one course above 199. Historical development of children's literature; philosophical and aesthetic bases.

457 Readings in English Education (4)
Prereq: jr or sr. Recent developments in English education and application to teaching of jr. or sr. high school English.

460 Literary Topics (4)
Prereq: Three courses from 310–323 and sr. Concentrated attention to one literary topic, e.g., a genre, theme, rhetoric, or literary theory. Topics are announced quarterly in the departmental course description booklet available in Ellis Hall.

464 Major English Authors (4)
Prereq: Three courses from 310–323 and sr. Authors to be studied vary section to section, quarter to quarter, and are announced quarterly at preregistration in the departmental course description booklet available in Ellis Hall.

465 Major American Authors (4)
Prereq: Three courses from 310–323 and sr. Authors to be studied vary section to section, quarter to quarter, and are announced quarterly at preregistration in the departmental course description booklet available in Ellis Hall.

483 Form and Theory of Literary Genres: Nonfiction (4)
Prereq: 250. Instruction and practice in writing creative nonfiction, with attention to fictionalized biography and literary essays.

486 Advanced Workshop in Fiction (4)
Prereq: 293 and perm in advance.

487 Advanced Workshop in Poetry (4)
Prereq: 294 and perm in advance.

499H Honors Project (5–15)
Prereq: perm. Completion of individual writing project for A.B. with honors in English.

499T English Tutorial (1–15)

Humanities (HUM)

107 Humanities—Great Books (4) (2H)
Prereq: jr and soph only. (fall) Ancient classics of Western civilization (Greek, Roman, Biblical) leading toward understanding of cultural heritage. Guidance in critical thinking, reading, and writing about those works.

108 Humanities—Great Books (4) (2H)
Prereq: jr and soph only. (spring) Modern classics of Western civilization (18th–20th centuries). See 107 for further description.

109 Humanities—Great Books (4) (2H)
Prereq: jr and soph only. (winter) Medieval and Renaissance classics of Western civilization. See 107 for further description.

117 Humanities—Great Books of the Orient (4) (2H)
Prereq: jr and soph only. (spring) Modern classics of Western civilization (18th–20th centuries). See 107 for further description.

307 Humanities—Great Books (4)
Prereq: jr and sr only. (fall) Ancient classics of Western civilization (Greek, Roman, Biblical) leading toward understanding of cultural heritage. Guidance in critical thinking, reading, and writing about those works. (Credit not allowed for both 307 and 308.)

308 Humanities—Great Books (4)
Prereq: jr and sr only. (winter) Medieval and Renaissance classics of Western civilization. See 307 for further description. (Credit not allowed for both 308 and 309.)

309 Humanities—Great Books (4)
Prereq: jr and sr only. (spring) Modern classics of Western civilization (18th–20th centuries). See 307 for further description. (Credit not allowed for both 309 and 308.)

477T English Tutorial (1–10)
Prereq: approval from Department of English tutorial director; arts and sciences major. Winter quarter, second year.

478T English Tutorial (1–10)
Prereq: approval from Department of English tutorial director; arts and sciences major. Spring quarter, second year.

481 Form and Theory of Literary Genres: Fiction (4)
Prereq: 8 hrs creative writing. Theoretical considerations of fiction.

482 Form and Theory of Literary Genres: Poetry (4)
Prereq: 8 hrs creative writing. Theoretical considerations of poetry.

483 Form and Theory of Literary Genres: Nonfiction (4)
Prereq: 363, 395, and perm. Theoretical considerations of nonfiction.

486 Advanced Workshop in Fiction (4)
Prereq: 293 and perm in advance.

487 Advanced Workshop in Poetry (4)
Prereq: 294 and perm in advance.

498 Advanced Workshop in Nonfiction (4)
Prereq: 395. This is the third in the sequence of nonfiction writing workshops. Students will be expected to produce at least three essays in workshop, participate in advanced readings in the form, and submit a final portfolio.

490 Independent Reading (1–15)
Prereq: perm. Directed individual reading and research.

497T English Tutorial (1–15)

498T English Tutorial (1–15)
Prereq: HTC student. (winter) Thesis.

499H Honors Project (5–15)
Prereq: perm. Completion of individual writing project for A.B. with honors in English.

499T English Tutorial (1–15)
Prereq: HTC student. (spring) Thesis.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBIO 100</td>
<td>The World of Plants (4) (2N)</td>
<td>4</td>
<td></td>
<td>Survey of variety of plants and how they affect and are affected by humans. 4 lec.</td>
</tr>
<tr>
<td>PBIO 100L</td>
<td>The World of Plants with Laboratory (5) (2N)</td>
<td>5</td>
<td></td>
<td>Same lecture as 100 with additional laboratory to provide practical experience with plants and topics discussed in lecture. 4 lec, 2 lab.</td>
</tr>
<tr>
<td>PBIO 102</td>
<td>Plant Biology (5) (2N)</td>
<td>5</td>
<td></td>
<td>For nonscience majors. Not offered on the Athens campus. Structure of seed plants as related to function. Survey of plants with emphasis on life histories, reproduction, and relationships of selected plant groups. Credit not allowed for both 102 and 111. 4 lec, 2 lab.</td>
</tr>
<tr>
<td>PBIO 103</td>
<td>Plants and People (4) (2N)</td>
<td>4</td>
<td></td>
<td>Introduces students to plants and their interactions from both historical and modern points of view, origins of agriculture and civilization, tropical and temperate food plants, medicinal plants, drug plants, destruction of environment, and its ultimate effect on food plants. 3 lec, 1 disc.</td>
</tr>
<tr>
<td>PBIO 210</td>
<td>Plant Physiology (4)</td>
<td>4</td>
<td></td>
<td>Prereq: 17 hrs plant biology and jr standing. Basic concepts, theory, and case studies developed from the modern structure and function of cells, organelles, and reproductive features of major groups; emphasis on evolution of diversity through systematically significant adaptations. 3 lec, 6 lab.</td>
</tr>
<tr>
<td>PBIO 211</td>
<td>Plant Physiology (6)</td>
<td>6</td>
<td></td>
<td>Prereq: tutorial college. (spring) Plant Developmental Physiology. 3 lec, 4 lab.</td>
</tr>
<tr>
<td>PBIO 220</td>
<td>Woody Plants (4)</td>
<td>4</td>
<td></td>
<td>Prereq: tutorial college. (fall, winter) A. Trese. For nonscience majors. Identification of local flowers and discussion of the role of flowers in their natural environments. Credit not allowed if 309 completed. 2 lec, 4 lab.</td>
</tr>
<tr>
<td>PBIO 228</td>
<td>Trees and Shrubs (Dendrology) (4)</td>
<td>4</td>
<td></td>
<td>(fall) P. Cantino. Identification, nomenclature, classification, ecological relationships, and importance of native and introduced woody plants. 2 lec, 4 lab, supplementary field trips.</td>
</tr>
<tr>
<td>PBIO 297T</td>
<td>Plant Biology Tutorial (1-15)</td>
<td></td>
<td></td>
<td>Prereq: Tutorial college. (fall)</td>
</tr>
<tr>
<td>PBIO 298T</td>
<td>Plant Biology Tutorial (1-15)</td>
<td></td>
<td></td>
<td>Prereq: Tutorial college. (winter)</td>
</tr>
<tr>
<td>PBIO 299T</td>
<td>Plant Biology Tutorial (1-15)</td>
<td></td>
<td></td>
<td>Prereq: Tutorial college. (spring)</td>
</tr>
<tr>
<td>PBIO 307</td>
<td>Morphology of Algae and Bryophytes (6)</td>
<td>6</td>
<td></td>
<td>Prereq: 111 or 211. (spring, even years) M. Vis-Chiasson. Comparative studies of structure, evolutionary relationships, life histories, and reproduction of selected representatives of major groups of algae and bryophytes. 4 lec, 4 lab.</td>
</tr>
<tr>
<td>PBIO 308</td>
<td>Morphology of Vascular Plants (6)</td>
<td>6</td>
<td></td>
<td>Prereq: 111 or (115 and 211). (fall, even years) G. Rothwell. Diversity of vascular plants as reflected by structural, developmental, and reproductive features of major groups; emphasis on evolution of diversity through systematically significant adaptations. 3 lec, 6 lab.</td>
</tr>
<tr>
<td>PBIO 309</td>
<td>Plant Systematics and Ohio Flora (6)</td>
<td>6</td>
<td></td>
<td>Prereq: 111 or 211. (spring) P. Cantino. Principles. and methods of systematic classification, floral morphology, and evolution of flowering plants. Lab: identification and classification of spring flora. 3 lec, 6 lab, field trips.</td>
</tr>
<tr>
<td>PBIO 310</td>
<td>Biology of Fungi (5)</td>
<td>5</td>
<td></td>
<td>Prereq: 111 or 211. (fall) Morphology and life history studies of selected fungi of major groups; collection, isolation, and growth of selected fungi; fungal activities. 3 lec, 4 lab.</td>
</tr>
<tr>
<td>PBIO 311</td>
<td>Special Topics in Plant Biology (1-6)</td>
<td></td>
<td></td>
<td>Current and/or special topics in plant biology.</td>
</tr>
<tr>
<td>PBIO 313B</td>
<td>Supervised Study (1-3)</td>
<td></td>
<td></td>
<td>Prereq: plant biology major.</td>
</tr>
<tr>
<td>PBIO 322</td>
<td>Tropical Plant Ecology (4)</td>
<td>4</td>
<td></td>
<td>Prereq: PBIO 209 or 425 or BIOS 375. (fall) G. Matlack. Tropical rainforest studies around the world, including basic plant ecology, conservation, and management. 4 lec.</td>
</tr>
<tr>
<td>PBIO 331</td>
<td>Plant Genetics (5)</td>
<td>5</td>
<td></td>
<td>Prereq: 110 or 114 or BIOS 170. (spring) A. Trese. Basic principles of genetics as they relate to plants, including transmission, genic diversity, and evolution of genetic materials. 5 lec.</td>
</tr>
<tr>
<td>PBIO 353</td>
<td>Plant Developmental Physiology (4)</td>
<td>4</td>
<td></td>
<td>Prereq: 110 or 114 or BIOS 170. (spring, odd years). S. Wyatt. Growth and development in flowering plants. Topics include cell growth and differentiation in developing meristems, tissue and organ development in culture, dormancy and germination, flower induction, seed formation, growth regulators, and senescence. 4 lec.</td>
</tr>
<tr>
<td>PBIO 397T</td>
<td>Plant Biology Tutorial (1-15)</td>
<td></td>
<td></td>
<td>Prereq: Tutorial college. (fall)</td>
</tr>
<tr>
<td>PBIO 398T</td>
<td>Plant Biology Tutorial (1-15)</td>
<td></td>
<td></td>
<td>Prereq: Tutorial college. (winter)</td>
</tr>
<tr>
<td>PBIO 404</td>
<td>Undergraduate Research (3-6, max 6)</td>
<td></td>
<td></td>
<td>Prereq: 17 hrs plant biology and jr standing. Independent research under supervision of faculty member.</td>
</tr>
<tr>
<td>PBIO 406</td>
<td>Undergraduate Research/ Written Presentation (3-4)</td>
<td></td>
<td></td>
<td>Prereq: 17 hrs plant biology and jr standing. An independent research experience that includes a formal written presentation of the work. All work will be done under the supervision of a faculty member. No credit if PBIO 494 taken.</td>
</tr>
<tr>
<td>PBIO 407</td>
<td>Undergraduate Research/ Oral Presentation (3-4)</td>
<td></td>
<td></td>
<td>Prereq: 17 hrs plant biology and jr standing. An independent research experience that includes a formal oral presentation of the work. All work will be done under the supervision of a faculty member.</td>
</tr>
<tr>
<td>PBIO 410</td>
<td>Plants and Soil (4)</td>
<td>4</td>
<td></td>
<td>Prereq: 111 or 211. (spring) P. Cantino. (winter) Soil as environment for plant growth; interrelationships between plant and soil, role of soil organisms in cyclic processes; building and maintenance of soil fertility; relationships between soil and health of plants, animals, and humans. 3 lec, 2 lab.</td>
</tr>
<tr>
<td>PBIO 412</td>
<td>Plant Pathology (5)</td>
<td>5</td>
<td></td>
<td>Prereq: 111 or 211 (fall, odd years) A. Trese. Diseases of plants; history, types of pathogens and disease cycles, impact in nature and agriculture, disease control strategies. Isolation and identification of pathogens. 3 lec, 4 lab.</td>
</tr>
<tr>
<td>PBIO 415</td>
<td>Quantitative Methods in Plant Biology (5)</td>
<td>5</td>
<td></td>
<td>Prereq: PSY 221; 24 hrs of PBIO courses. (winter) B. McCarthy. Lecture: biostatistics and applications in the plant sciences; scientific method, hypothesis testing, and design of experiments; sampling, data analysis, regression and correlation, analysis of variance, and parametric and nonparametric diversity. Lab: microcomputer applications in spreadsheet analysis, statistics, and graphics. 4 lec, 2 lab.</td>
</tr>
<tr>
<td>PBIO 418</td>
<td>Writing in the Life Sciences (4)</td>
<td>4</td>
<td></td>
<td>Prereq: Jr, 15 hrs PBIO or BIOS (winter) S. Wyatt. Current research and public controversy relating to topics in biology and plant science will provide students with opportunities to practice and develop critical-thinking skills needed for successful verbal and written communication in the fields of plant science and biology. No credit toward major. 4 lec.</td>
</tr>
<tr>
<td>PBIO 420</td>
<td>Phyiology (5)</td>
<td>5</td>
<td></td>
<td>Prereq: 210 or 353, organic chemistry recommended. (spring) A. Faik. Basic chemical and physical aspects of plant processes; photosynthesis, respiration, mineral nutrition, transport, nitrogen metabolism, water relations, and growth. 3 lec, 4 lab.</td>
</tr>
<tr>
<td>PBIO 424</td>
<td>Plant Physiology (6)</td>
<td>6</td>
<td></td>
<td>Prereq: 210 or 353, organic chemistry recommended. (spring, (odd years) M. Vis-Chiasson. Taxonomy and ecology of marine and freshwater algae, with emphasis on identification and distribution of common or representative genera. 3 lec, 4 lab.</td>
</tr>
<tr>
<td>PBIO 426</td>
<td>Physiological Plant Ecology (5)</td>
<td>5</td>
<td></td>
<td>Prereq: 209 or 425; (spring, odd years) K. Brown. A survey of the complexity of plant physiological and structural adaptations that relate to plant ecological performance. Comparisons of plant characteristics from many biomes. Emphasis on reading and discussing peer-reviewed literature. Labs feature hands-on learning of micrometeorite, physiological protocols, synthesis and interpretation of data. 3 lec, 4 lab, 1 Saturday field trip.</td>
</tr>
<tr>
<td>PBIO 427</td>
<td>Molecular Genetics (3)</td>
<td>3</td>
<td></td>
<td>Prereq: 331 or 431 or BIOS 325; organic chemistry. (spring) A. Showalter. Genetic fine structure and function at the molecular level; biochemical aspects of heredity in micro-organisms, plants, and animals; recombinant DNA and genetic engineering. 3 lec.</td>
</tr>
<tr>
<td>PBIO 431</td>
<td>Plant Cell Biology (5)</td>
<td>5</td>
<td></td>
<td>Prereq: 110 or BIOS 170. (fall) A. Faik. Structure and function of cells, organelles, and cellular inclusions. 3 lec, 4 lab.</td>
</tr>
<tr>
<td>PBIO 435</td>
<td>Plant Population Biology (5)</td>
<td>5</td>
<td></td>
<td>Prereq: PBIO 209 or 425 or BIOS 375 (winter, even years) G. Matlack. Acquaint students with basic demographic processes as experienced by plant populations; 2) explore the demographic implications of a range of plant growth forms and life histories; 3) present the material in the context of a variety of models. The course will take an evolutionary/behavioral approach to plant populations. 3 lec, 4 lab.</td>
</tr>
<tr>
<td>PBIO 436</td>
<td>Plant Community Ecology (5)</td>
<td>5</td>
<td></td>
<td>Prereq: PBIO 209 or 425 or BIOS 375. (fall, even years) B. McCarthy. Advanced concepts and theory of plant community ecology. Emphasis will be placed on the interplay between theory and empirical studies. Classic literature will be reviewed and case studies developed from the modern</td>
</tr>
</tbody>
</table>
literature to explore current ideas of theory, approach, and experimentation. Laboratories will emphasize modern field methods of vegetation analysis and environmental assessment. 3 lec, 4 lab.

437  Ecosystem Ecology (4) Prereq: CHEM 122 or 152, PIBIO 209 or BIOS 375 (fall) K. Brown. Analysis of the composition, function, and heterogeneity of ecosystems. Topics include atmospheric, biophotic, and geophysical controls on ecosystem function, comparisons of aquatic and terrestrial ecosystems, ecosystem production, nutrient cycling and trophic dynamics. Synthesis with evaluation of human impacts on ecosystems, locally and globally. 4 lec.

442  Experimental Anatomy of Plant Development (6) Prereq: PIBIO 210 or 424 (winter) S. Wyatt and G. Rothwell. The concepts of plant development have been integrated with the descriptive assessment of cell, tissue, and organ types that are the mainstay of plant anatomy to provide an exciting opportunity for all plant biologists. The course is grounded in experimentation and includes cutting edge methodologies. 3 lec, 6 lab.

450  Biotechnology and Genetic Engineering (4) Prereq: 110 or BIOS 170. (Fall) A. Showalter. For upper level undergraduate students. Introduction to basic molecular biological concepts and techniques in biotechnology and genetic engineering, including discussion of current experience and progress in these fields. 4 lec.

460  Paleobotany (6) Prereq: 110 or BIOS 170. G. Rothwell. Morphology and evolution of representative fossil plant groups. 3 lec, 6 lab.

475  Plant Speciation and Evolution (3) Prereq: jr or sr majors in PIBIO, BIOS. (winter, even years) H. Ballard. Principles of evolution of plants and current topics in evolutionary biology. 3 lec.

480  Molecular Approaches in Plant Systematics, Ecology and Evolution (5) Prereq: 110 or BIOS 170 (winter, odd years) H. Ballard. Overview of comparative molecular approaches used to infer relationships in plants at level of populations, species and lineages. 3 lec, 4 lab.

490  Internship (max 10) Prereq: permission. Provides students with credit for work experience in various applied fields of botany and environmental biology. Open to a faculty member and evaluated by the on-the-job supervisor. Report culminates experience.


Environmental Engineering Technology (EVT)

The following courses for the A.A.S. in environmental engineering technology are available only on the Chillicothe campus:

100  Introduction to Environmental Engineering Technology (3) Topics include toxicology, air pollution, groundwater contamination, transportation of hazardous materials, waste characterization, waste management, and waste treatment and disposal, with discussion of how regulations affect each.

110  Computational Methods in Environmental Engineering Technology (3) Emphasizes the principles of data treatment, including experimental error recognition, statistical analysis, and graphical data techniques using up-to-date computer software. Computers and programmable calculators will be required for writing lab reports. 3 lec, 2 lab.

115  Legal Aspects of Environmental Engineering (2) Introduction to legal aspects of the rights and duties of the individual, business, and society with regard to the environment, and the consequences of future environmental legislation. Investigates environmental law through private and public regulations and examines case studies highlighting the existing laws.

120  Introduction to Environmental Chemistry (3) Prereq: CHEM 121 or 151. Environmental chemistry as applied to aquatic, atmospheric, soil, and hazardous waste systems. Topics include environmental chemical cycles; aquatic, atmospheric, and soil chemistry; environmental chemistry of hazardous wastes; and toxicology. 2 lec, 2 lab.

125  HAZWOPER Training (3) Provides certification required to work on a majority of environmental cleanup sites. Covers regulatory obligations, handling hazardous materials, personal protective equipment, monitoring instrumentation, emergency response, site control, medical assessment, confined space entry, and respiratory protection. 3 lec, 2 lab.

125L  HAZWOPER Training Laboratory (1) Emphasizes handling hazardous materials with use of personal protective equipment, instrumentation, and equipment. Outdoor simulations and demonstrations included. 3 lab.

140  Introduction to Air Pollution (3) Prereq: 110; CHEM 121 or 151. Principal types; sources; dispersion effects; and physical, economic, and legal aspects of controlling atmospheric pollutants. Emphasizes atmospheric chemical reactions due to air pollutant emissions. 3 lec, 2 lab.

150  Instrumentation in Environmental Analysis (3) Prereq: 110; CHEM 121 or 151. Provides foundation for understanding principles behind instrumentation used for environmental analysis. Gas chromatographs, mass spectrometers, infrared spectrophotometers, FIDs, and PID are studied. 3 lec, 3 lab.

190  Internship/Practicum/Cooperative Education (1, max 20) Required for students on approved work assignments. May be used to report on work activities. Credit is not applicable toward specific degree requirements but will accumulate in academic credit total.

198A–Z  Special Topics (1–5, max 20) Provides an opportunity to complete individual projects that involve special topics concerning environmental engineering technology problems.

200  Site Investigation, Sampling, and Monitoring (3) Prereq: 110. Field-oriented course involving hazardous materials site investigation, characterization, and cleanup. Topics are planning and organization, training and medical programs, site assessment, sampling and monitoring, site control, hazardous materials handling, and emergency response.

200L  Site Investigation, Sampling, and Monitoring Laboratory (1) Prereq: 110. Field-oriented course involving hazardous materials site investigation, characterization, and cleanup. Topics are planning and organization, training and medical programs, site assessment, sampling and monitoring, site control, hazardous materials handling, and emergency response. 3 lab.

210  Introduction to Health Physics (3) Addresses fundamental principles of health physics and radiation protection. Topics include atomic structure, types of radiation, radioactive decay, methods of radiation detection, dosimetry, biological effects, and radiation protection.

210L  Health Physics Laboratory (1) Emphasizes use of health physics instrumentation including rate meters, scintillation counters, radon detection, and gamma spectrometry as they apply to personal and environmental monitoring. 3 lab.

220  Fluid Mechanics (3) Prereq: 110. Fundamentals of fluid mechanics as applied to surface and groundwater, wastewater, and air emissions management. Topics include basic hydraulics, friction loss, pressure, flow measurement, pump types and characteristics, and schematic interpretation.

240  Air Sampling and Analysis (3) Prereq: 110, 140. Provides experience in ambient and indoor sampling. Instrumentation is used to provide real-time data collection and analysis. Emphasis on methods that determine the concentration of normally encountered air pollutants.

240L  Air Sampling and Analysis Laboratory Prereq: 110, 140. Emphasizes air flow measurements using devices that demonstrate volumetric displacement, velocity impaction, viscosity, and pressure. Provides techniques for determining accuracy, precision or repeatability, and calibration. 3 lab.

245  Wastewater Treatment (3) Prereq: 110, 120. Introduction to wastewater treatment technologies. Covers regulations and phases of treatment for wastewater treatment systems. Liquid-solid waste streams, and basic system process control.

250  Analysis of Environmental Pollutants (3) Prereq: CHEM 121 or 152 and 151 and 152. Covers important techniques necessary for analyzing environmental samples. Methods established by EPA are used to analyze samples for heavy metals, volatiles, and semi-volatiles.

250L  Analysis of Environmental Pollutants Laboratory (1) Prereq: CHEM 121 and 122, or 151 and 152. Emphasizes lab instrumentation for liquid chromatography, GC/MS, AA, and IR spectrophotometer. Lab reports required from the analysis of soil and water samples. 3 lab.

260  Environmental Risk Assessment (3) Analyzes risk assessment process applied to environmental problems. Uncertainty factors, risk analysis, and exposure characterization, fate, and transport models will be addressed.

290  Internship/Practicum/Cooperative Education (1, max 20) Required for students on approved work assignments. May be used to report on work activities. Credit is not applicable toward specific degree requirements but will accumulate in academic credit total.

298A–Z  Special Topics (1–5, max 20) Provides an opportunity to complete individual projects that involve special topics concerning environmental engineering technology problems.

Equine Studies (EQU)

The following courses for the A.A.S. in equine studies are available only on the Southern campus:

101  Introduction to Equine Studies (4) Overview of the history of the horse, evaluation, selection, breeds, equipment, nutritional requirements, safe handling of horses, showmanship, equine reproduction, and career and leadership opportunities in the horse industry.

110  Equine Nutrition (4) Study of the equine digestive system, nutrient requirements of horses at various levels of performance, and problems associated with feeds and feeding practices.

120  Equine Anatomy and Physiology (4) Prereq: BIOA 101. Study of the structure and functions of the horse through the various anatomical systems.

125  Equine First Aid and Preventive Medicine (5) First aid and emergency treatments, preventive medicine, diseases, and parasites in horses.

200 Equine Reproduction (4)
Prereq: 101. Comprehensive study of equine reproduction stressing the anatomy and physiology of the stallion and mare and methods of breeding, including artificial insemination, and foaling.

215 Equine Business Management (4)
Prereq: CS 120. Study and practice of basic concepts, techniques, procedures of accounting involved in managing and analyzing equine records from the management viewpoint. Designed to integrate general business concepts with practical applications in the horse industry. Topics include general business laws, equine law, public relations, insurance, bookkeeping, contracts, taxes, and starting and maintaining a horse operation.

220 Farm and Stable Management (4)
Study of the management of a working horse farm. Topics include scheduling, budgeting, equipment use and management, land management, facilities management, site selection and design, and safety.

225 Equestrian Teaching Techniques (3)
Study of the methods of teaching riding. Emphasis on the ability to work with riders with disabilities and challenges. It is essential for instructors to research and know the issues these riders face and formulate lesson plans according to individual needs and goals.

285 Preparation for Therapeutic Riding Instructor Certification (3)
Prereq: to prepare students for the Registered Level Therapeutic Riding Exam offered by the North American Riding for the Handicapped Association. The course covers all components of the test and provides lecture and active experience with immediate evaluation and feedback.

286 Administrative Aspects of Therapeutic Riding (3)
Provides information on administrative issues and aspects of therapeutic riding, the riding center, and overall management. The course includes goal setting, strategic planning, legal issues, and working with boards.

287 Evaluation and Training of the Therapy Horse (2)
This course rounds out the therapeutic riding student's education to include evaluation and training of horses brought into a therapy program. This knowledge and awareness increases the safety and therapeutic value of the sessions for the therapeutic riding client.

290 Equine Field Experience (1–4)
Field experience which might include trips to horse farms, race tracks, veterinary clinics, museums, horse shows or events, or seminars offered through recognized organizations or individuals.

295 Equine Internship (1–6)
Practical experience in a specific area of equine studies pertinent to the individual's interests. Examples include working with breeders, trainers, farm and stable managers, riding instructors, breed associations or organizations, veterinarians, and related equine agencies.

299 Studies in Equine Issues (1–4)
Study of topics of current interest in the horse industry.

Film (FILM)

201 Introduction to Film I (4) (2H)
Prereq: soph. (fall) Studies in the history of world cinema, from 1895 to the present. Weekly screenings of silent and sound, American and international films.

202 Introduction to Film II (4) (2H)
Prereq: soph. (winter) Introduction to film analysis, with emphasis on formal aspects of film art such as sound, lighting, mise-en-scene, etc. Weekly screenings.

203 Introduction to Film III (4) (2H)
Prereq: soph. (spring) Special topics in film studies, genres, movements, and forms. Weekly screenings.

338 Studies in the Documentary Film (3)
Prereq: 203. (winter) Special topics in the history, theory, and criticism of documentary film and video. Weekly screenings.

340 Film Techniques (4)
Prereq: 201. Introduction to motion picture production techniques. Students will design, shoot, and edit their own projects.

343 Scriptwriting (4)
Prereq: 201 or 202. Introduction to motion picture production techniques. Students will design, shoot, and edit their own projects.

344J The Practice of Film Criticism (4) (11)

421 International Film I (4)
Prereq: 201. Analysis of the relationship between film and culture, with emphasis on how cultural meanings influence film aesthetics and the critical assessment of the medium. Films of several film-making nations such as Brazil, China, India, Sweden, and the United States will be screened for study.

422 International Film II (4)
Prereq: 201. The development of a nation's or cultural region's films is traced, with emphasis on contemporary works. Cultures under study vary yearly and may include the films of Brazil, China, Germany, Eastern Europe, Italy, Southeast Asia, etc.

423 International Film III (4)
Prereq: 201. The aesthetics and uses of film and related technologies in the study of both Western and non-Western peoples is studied, with emphasis on the documentary and experimental film. Assignments include field exercises with image-making equipment.

431 Film History I (4)
Prereq: 201 or 202. (fall) Advanced study of the history and historiography of the motion picture. Emphasis on alternatives to the film canon and revisionist approaches to film history. Weekly screenings.

432 Film History II (4)

433 Film History III (4)

444 Media Certs Management (4)
Practical assignments in association with the Athens (Inter) National Film and Video Festival.

451 Film Theory and Criticism I (4)

452 Film Theory and Criticism II (4)

453 Film Theory and Criticism III (4)
Prereq: 452. (spring) Special topics in film theory and criticism, including auteurism, structuralism, formalism, and feminism. Weekly screenings.

461 Motion Picture Production I (5)
Prereq: Honors Tutorial College Film major. (fall) Professional 16mm film production. Instruction in basic camera and lighting techniques, elementary film structure, and bench editing leading to production of individual silent film projects.

462 Motion Picture Production II (5)
Prereq: Honors Tutorial College Film major. (winter) Continuation of 361 introducing sound motion picture shooting and editing techniques, A and B roll preparation.

463 Motion Picture Production III (5)
Prereq: Honors Tutorial College Film major. (spring) Continuation of 362. Advanced sound motion picture production techniques.

471 Film Topics Seminar (1–5)
Prereq: perm. (fall) Investigation of selected motion picture topic announced in advance of registration. Focus may be scholarly/critical, industry related, or aspect of motion picture production or screenplay. Topics and credit hours vary.

472 Film Topics Seminar (1–5)
Prereq: perm. (winter) See 471 for description.

473 Film Topics Seminar (1–5)
Prereq: perm. (spring) See 471 for description.

490 Individual Production Problems (1–5)
Prereq: perm. Individual production of motion picture. May be repeated.

491 Individual Readings (1–5)
Prereq: perm. Readings and reports on works related to motion pictures. Reading list is selected by student in consultation with faculty member. May be repeated.

492 Independent Study (1–5, max 10)
Prereq: perm. Advanced individual creative or scholarly work in film.

497F Film Tutorial (1–15)
Prereq: Honors Tutorial College Film Major
Finance (FIN)

102 Personal Money Management (4)
Prereq: frsoph only. How to live better financially. Relating one's personal goals to money management in terms of expenditures, savings, and tax considerations. Financial media that serve the individual such as life insurance, savings, securities, and consumer and mortgage credit.

298 Internship (1)
Prereq: perm. Internship experience that provides on-site exposure to general business operations and procedures. Intended for experiences following the freshman year.

301 Fundamentals of Finance (4)
Prereq: ACCT 102 and QBA 201 or PSY 221 or ECON 381 or COMS 301 or GEOG 271 or MATH 251; no credit for COB students. Problems in managing personal finances. Budgeting expenditures and savings. Planning life insurance programs; investment in savings accounts, securities, and other financial assets. Use of consumer and mortgage credit. Personal taxes.

310 Foundations of Financial Management (4)
Prereq: ACCT 102, QBA 201 or PSY 221 or ECON 381 or COMS 301 or GEOG 271 or MATH 251; no credit for COB majors. This course introduces the student to the basic principles of short-term and long-term corporate financial management.

325 Foundations of Finance (4)
Prereq: ACCT and ACCT 102; QBA 201 or PSY 120, 121, or 221 or ECON 381 or COMS 301 or GEOG 271; jr. Role of financial management in business enterprises. Financial analysis; short-term and long-term funds; planning for profits; capital budgeting; internal management of working capital and income; raising funds to finance growth of business enterprises.

327 Financial Markets and Institutions (4)
Prereq: FIN 325, jr. and perm. Flow of funds and interest-price movements in money and capital markets. Supply of loanable funds and demand for funds in mortgage loan market, consumer credit markets, corporate securities markets, and markets for government securities and municipal obligations. Consideration of effects on financial markets of Federal Reserve and Treasury policies.

331 Risk and Insurance (4)
Prereq: jr or sr and perm. Social importance of risk and its place in personal, business, and national life, including principles and methods of handling risk. Special interest in technique of insurance.

341 Investments (4)

398 Internship (1–4)
Prereq: perm. Internship experience that provides opportunities to learn by participation in day-to-day activities of a business concern for at least four consecutive weeks. Intended for experience following the sophomore year.

410 Personal Financial Planning (4)
Prereq: 325. Introduction to financial planning for individuals. This course will survey the topics of money management, insurance planning, investment planning, retirement planning, and estate planning.

420 Financial Banking Law (4)
Prereq: jr. This course is designed for students seeking to understand the law and policy of banking and financial institutions (bank, thrift, and credit union). The course emphasizes economic, historical, and legal backgrounds of financial institutions; the financial institution regulatory process; and consumer laws.

428 Management of Financial Institutions (4)
Prereq: 327 or perm. Analysis of objectives, functions, practices, and problems of financial institutions as viewed by management of these institutions.

436 Life Insurance (4)
Prereq: 331, perm. Fundamental economics of life insurance. Principles and practices of life insurance including types of contracts, group and industrial insurance, and annuities.

437 Personal and Business Financial Planning (4)
Prereq: jr. 331. Basics of IRS as it applies to personal and corporate taxes, as well as completion of form 1040. Information required on advising clients, as well as personal, concerning estate planning, taxes, trusts, gifts, etc., and how to gather information.

440 Group Insurance and Employee Benefits (4)
Prereq: FIN 331. The study of group life insurance, health insurance and pensions; application to “real life” employee benefits; and exposure to guest speakers from the insurance and securities industry.

441 Business Insurance and Estate Cases (4)
Prereq: two from among 436, 437, 439, and 440. A summary course for students in the risk and insurance field. New cases assigned each week requiring presentations in class and written recommendations on hypothetical cases presented by small student groups. Lectures by practicing professionals from related disciplines (law, accounting, trusts, employee benefits) are scheduled to demonstrate the broad nature of estate planning practice.

442 Security Analysis (4)
Prereq: FIN 341. Equity security analysis using various quantitative and qualitative methods. Interpretation of financial statements, market analytical techniques to arrive at investment decisions.

444 Risk Management (4)
Prereq: 327 or perm. Description of derivatives markets, trading, and institutions. Text is supplemented by current readings and derivatives trading simulations.

445 Portfolio Management (4)

450 Credit and Lending Principles of Financial Institutions (4)
Prereq: 325. Provides examination of basic functions involved in supplying credit to borrowers by financial institutions. Organizational framework and division aspects of process studied. Significant policy issues and implications covered.

452 Small Business Finance (4)
Prereq: 325. Application of basic financial management techniques to small business environment (100 or fewer employees). Problems faced by persons within the small business and recommendations for alternative solutions to most commonly discovered problems. Micro view, nuts-and-bolts approach used. Throughout course, but consistent with broad macro overview set of company objectives.

455 International Finance (4)
Prereq: 325. Provides an introduction to the world of both domestic and international finance. Financing international trade and other transactions; foreign exchange market, exchange market, and exchange rate controls; international payments system. Foreign central banking and current developments in international financing cooperation.

461 Financial Management and Policy (4)

463 Capital Allocation (4)

465 Mathematical Analysis of Financial Decisions (4)
Prereq: 325, perm. Application of quantitative methods to financial management, with special emphasis on systems approach to evaluating proposed financial decisions.

491 Seminar (3, 4, or 5)
Prereq: perm. Selected topics of current interest in finance area.

497 Independent Research (1–4)
Prereq: perm. Research in selected fields of finance under direction of faculty member.

498 Internship (1–4)
Prereq: perm.

Foreign Languages and Literatures
(see also: Modern Languages)

Chinese (Asian) (CHIN)

111 Elementary Chinese (4)
(fall) Beginning course of 3-qt-r sequence.

112 Elementary Chinese (4)
Prereq: 111 or equiv. (winter) Continuation of 111.

113 Elementary Chinese (4)
Prereq: 112 or equiv. (spring) Continuation of 112.

169A Spoken Business Chinese (4)
A task-oriented introduction to the basic communicative functions and business terminologies of the Chinese language. Chinese culture and alphabetic Chinese writing will also be introduced; the Chinese character writing system will not be used. Does not satisfy the foreign language requirement.

211 Intermediate Chinese (4) (2C)
Prereq: 113 or equiv. (fall) 1st course of 3-qt-r intermediate-level sequence.

212 Intermediate Chinese (4) (2C)
Prereq: 211 or 213 or equiv. (winter) Continuation of 211.

213 Intermediate Chinese (4) (2C)
Prereq: 212 or equiv. (spring) Continuation of 212.

211 Advanced Chinese (4)
Prereq: 213 or equiv. (fall) Beginning of advanced-level sequence.

212 Advanced Chinese (4)
Prereq: 311 or equiv. (winter) Continuation of 311.

213 Advanced Chinese (4)
Prereq: 312 or equiv. (spring) Continuation of 312.

399 Special Studies in Chinese (1–3)
Prereq: perm. Reading and discussion of arrangement of assignments in books, periodicals, and tapes on specific topics related to Chinese language and culture.

French (Romance) (FR)

111 Elementary French (4)
Beginning course of 3-qt-r sequence. Basic grammatical concepts and patterns. Emphasis on development of reading, listening comprehension, speaking, and writing skills. Basic text and workbook used. Lab required. No credit if 199.

112 Elementary French (4)
Prereq: 111. Continuation of 111. Basic text, workbook, and readings used. Lab required. No credit if 199.

113 Elementary French (4)
Prereq: 112. Continuation of 112. Basic text, workbook, and readings used. Lab required. No credit if 199.

199 French for Review (4)
No CR if 111, 112 or 113. (fall) Preparation for FR
Courses / Foreign Languages and Literatures

211 Intermediate French (4) (2C)  
Prereq: 113 or 2 or 3 yrs h.s. French. 1st course of 3-qr intermediate-level sequence. Intensive review of grammar. Additional readings with discussion in French. Supplemental cultural material.

212 Intermediate French (4) (2C)  
Prereq: 211 or perm. Continuation of 211.

213 Intermediate French (4) (2C)  
Prereq: 212 or 4-5 yrs h.s. French. Reading and discussion of selected modern works. Completion of 213 fulfills foreign language requirement of College of Arts and Sciences.

298 Independent Study in French (1-2, max 6)  
Prereq: 213 or perm. Reading and discussion of assigned materials (books, periodicals, films, tapes) on specific topics involving French language. Does not count toward major or minor. Does not satisfy language requirement.

341 Advanced Conversation and Composition (4)  
Prereq: 213 or perm. Speaking and writing based on readings and assigned topics. Grammar review.

342 Advanced Conversation and Composition (4)  
Prereq: 341 or perm. Continuation of 341.

343 Advanced Conversation and Composition (4)  
Prereq: 342 or perm. Continuation of 342.

345 French for Business (4)  
Prereq: 343. Professional-oriented language and culture training in French. Reading, writing, listening, and speaking skills are emphasized in a business context.

348 French Civilization and Culture (4)  
Prereq: 341 or 342 or 343. Social, political, and cultural history of France from Middle Ages to Revolution. Readings, discussions, class reports, and short papers.

349 French Civilization and Culture (4)  
Prereq: 341 or 342 or 343. (spring) Continuation of 348, covering 1799 to present. France in the modern world.

354 Introduction to Reading French Literature (4)  
Prereq: 341 or 342 or 343. Designed to prepare students to meet the challenges of advanced literature courses. Close reading techniques will enable students to read modern French works with speed and comprehension. Basic aspects of literary analysis and theory will be emphasized.

355 Introduction to Prose (4)  
Prereq: 354. Reading and discussion of French novels, short stories, and other narrative genres representing various literary traditions.

356 Introduction to Drama and Poetry (4)  
Prereq: 353. Reading and discussion of French drama, as literary text and theatrical performance, and lyric poetry from several historical periods.

396 Internship in French (1-5)  
Prereq: perm of internship director. Practice using the language in a work environment. Does not count for major.

415 French Literature of the Renaissance (4)  
Prereq: 354, 355 or 356. Major 16th-century poets, including Du Bellay and Ronsard.

416 French Literature of the Renaissance (4)  
Prereq: 354, 355 or 356. Major 16th-century prose writers, including Rabelais and Montaigne.

418 17th-Century French Literature (4)  
Prereq: 354, 355 or 356. Works by numerous authors, including at least some of following: Descartes, Pascal, La Fayette, La Rochefoucauld, La Bruyère, La Fontaine, and Bossuet.

419 17th-Century French Literature (4)  
Prereq: 354, 355 or 356. Major plays of Corneille, Racine, and Mollière.

423 18th Century (4)  
Prereq: 354, 355 or 356. French literature and thought in Age of Enlightenment.

424 18th Century (4)  
Prereq: 354, 355 or 356. Continuation of 423.

425 Romanticism (4)  
Prereq: 354, 355 or 356. Romanticism in drama, poetry, and fiction of first half of 19th century.

426 Realism and Naturalism (4)  
Prereq: 354, 355 or 356. Major fictional works of 19th century.

427 French Poetry in the Second Half of the 19th Century (4)  
Prereq: 354, 355 or 356. Poetry of Baudelaire, Verlaine, Rimbaud, Mallarmé, and others.

429 20th-Century French Literature I (4)  
Prereq: 354, 355 or 356. French prose fiction before WWII.

431 20th-Century French Literature II (4)  
Prereq: 354, 355 or 356. French prose fiction since WWII.

433 20th-Century French Literature III (4)  

434 French Through Film (4)  
Prereq: 342. Early development of the French cinema and its more recent filmmakers, actors, and actresses. Films are studied in their cultural and historical contexts. Students increase their French proficiency through listening, speaking, reading, and writing.

435 Proseminar (1-4, max 12)  
Prereq: 354, 355 or 356. Subject will vary. May be repeated when subject changes.

437 Applied Phonetics (4)  
Prereq: 343 or perm. (fall) Systematic study of segmental and prosodic elements of French pronunciation including extensive oral practice.

439 Modern French Usage (4)  
Prereq: 343 or perm. (winter) Fine points of grammar. Practice in composition and analysis of texts.

440 Teaching French: Theory and Practice (4)  
Prereq: 343. Provides an introduction to current theories about learning and teaching modern foreign languages, with a focus on the particularities of teaching French language and cultures; opportunities to apply that theoretical knowledge to classroom teaching; and opportunities to develop a deeper knowledge of and more proficiency in French language and cultures. Does not count for major.

441 Stylistics and Criticism (4)  

454 Francophone Literature of Sub-Saharan Africa, Maghreb, and the Caribbean (4)  
Prereq: 355 or 356. Representative works by 20th century Francophone Sub-Saharan, Maghreb, and Caribbean writers, including at least, but not limited to, Malika Mokkadem, Leopold Senghor, Ferdinand Oyono, Maryse Conde, and Simone Schwartz-Bart. Works are studied in their historical and cultural contexts. Readings, lectures, films, and discussions.

464 Francophone Literature of Quebec (4)  
Prereq: 355 or 356. Representative works by 20th century writers of Quebec including at least, but not limited to, Anne Hébert, Roch Carrier, Michel Tremblay, Marie-Claire Blais, and Yves Beauchemin. Works are studied in their historical and cultural contexts. Readings, lectures, films, and discussions.

498 Independent Study in French (1-2, max 4)  
Prereq: 8 credits at 300 level or perm of dept chair. Directly individual readings, discussion, and reports in language at advanced level. Does not count toward 400-level hrs required for major. Maximum of two credits may count toward minor.

German (Germanic) (GER)  

111 Elementary German (4)  
Introduction to pronunciation and basic grammar. Development of comprehension and speaking skills. Beginning course of 3-qr 1st-yr sequence.

112 Elementary German (4)  
Prereq: 111. Continuation of 111.

113 Elementary German (4)  
Prereq: 112. Continuation of 112. Continued development of skills of oral and written production and comprehension.

111 Intermediate German (4) (2C)  
Prereq: 113 or 2 or 3 yrs h.s. German. Continued development of listening comprehension, reading, and writing skills. Grammar review. Lab required. 1st course of 3-qr intermediate-level sequence.

121 Intermediate German (4) (2C)  
Prereq: 211 or perm. Continuation of 211. Emphasis on discussion of modern texts. Continued development of listening comprehension and speaking and writing skills. Lab required.

213 Intermediate German (4) (2C)  
Prereq: 212 or 4-5 yrs h.s. German. Modern German texts are read and form basis for discussions and written assignments. Completion of 213 fulfills foreign language requirement of College of Arts and Sciences.

235 German Drama on Stage (1-4) (winter) Presentation of German drama on stage. Private coaching in pronunciation and inflection of German. Credit varies according to role of student. May be repeated for credit with perm.

298 Independent Study in German (1-2, max 6)  
Prereq: 213 or perm. Reading and discussion of assigned materials (books, periodicals, films, tapes) on specific topics involving German language. Does not count toward major or minor. Does not satisfy language requirement.

341 Advanced Conversation and Composition (4)  
Prereq: 213 or perm.

342 Advanced Conversation and Composition (4)  
Prereq: 341 or perm.

343 Advanced Conversation and Composition (4)  
Prereq: 342 or perm.

345 Business German (4)  
Prereq: 342. Development of the student’s linguistic abilities in German in a business context. Readings, videos, and discussions will focus on business terminology and practices in German-speaking countries. Written assignments include preparing a resume and a letter of application in German.

348 German Culture and Civilization (4)  
Prereq: 213 or perm. Historical, intellectual, and artistic aspects of German, Austrian, and Swiss culture from earliest times to present.

349 German Culture and Civilization (4)  
Prereq: 213 or perm. Continuation of 348.

355 Introduction to German Literature (4)  
Prereq: 213. Study of major literary works, with emphasis on 18th and 19th centuries.

356 Introduction to German Literature (4)  
Prereq: 213. Study of major literary works of 20th century.

396 Internship in German (1-5)  
Prereq: perm of internship director. Practice using the language in a work environment. Does not count for major.

425 19th-Century German Literature (4)  
Prereq: 355 and 356.

426 19th-Century German Literature (4)  
Prereq: 355 and 356.
Courses / Foreign Languages and Literatures

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>251X</td>
<td>Beginning Indonesian/Malaysian (Asian)</td>
<td>Prereq: 113 or equiv. (fall) 1st course of 3-qtr 1st-yr sequence.</td>
<td></td>
</tr>
<tr>
<td>252X</td>
<td>Intermediate Indonesian/Malaysian (Asian)</td>
<td>Prereq: 212 or equiv. (fall) Beginning of advanced-level sequence.</td>
<td></td>
</tr>
<tr>
<td>253X</td>
<td>Advanced Indonesian/Malaysian (Asian)</td>
<td>Prereq: 311 or equiv. (winter) Continuation of 211.</td>
<td></td>
</tr>
<tr>
<td>254X</td>
<td>Special Studies (1-3, max 9)</td>
<td>Prereq: perm. Independent study of topic of interest in Indonesian/Malaysian language or literature.</td>
<td></td>
</tr>
<tr>
<td>311</td>
<td>Elementary Indonesian/Malaysian (Asian) (INDO)</td>
<td>Prereq: 113 or equiv. (fall) 1st course of 3-qtr intermediate-level sequence.</td>
<td></td>
</tr>
<tr>
<td>312</td>
<td>Intermediate Indonesian/Malaysian (Asian) (2C)</td>
<td>Prereq: 212 or equiv. (spring) Continuation of 212.</td>
<td></td>
</tr>
<tr>
<td>313</td>
<td>Advanced Indonesian/Malaysian (Asian)</td>
<td>Prereq: 312 or equiv. (spring) Continuation of 312.</td>
<td></td>
</tr>
<tr>
<td>314</td>
<td>Greek Historians (4)</td>
<td>Readings in Greek from Herodotus and Thucydides.</td>
<td></td>
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<tr>
<td>315</td>
<td>Greek Comedy (4)</td>
<td>Readings in Greek from Aristophanes.</td>
<td></td>
</tr>
<tr>
<td>316</td>
<td>The Greek New Testament and the Milieu of Early Christianity (4)</td>
<td>Readings in Greek from the New Testament, the early Greek fathers, and/or non-Christian writers of interest for the study of early Christianity.</td>
<td></td>
</tr>
<tr>
<td>409</td>
<td>Advanced Greek Readings (2-4, max 18)</td>
<td>Prereq: 21 hrs. (on demand) Selections adapted to needs and interests.</td>
<td></td>
</tr>
<tr>
<td>427</td>
<td>19th-Century German Literature (4)</td>
<td>Prereq: 355 and 356.</td>
<td></td>
</tr>
<tr>
<td>428</td>
<td>20th-Century German Literature (4)</td>
<td>Prereq: 355 and 356.</td>
<td></td>
</tr>
<tr>
<td>430</td>
<td>20th-Century German Literature (4)</td>
<td>Prereq: 355 and 356.</td>
<td></td>
</tr>
<tr>
<td>431</td>
<td>20th-Century German Literature (4)</td>
<td>Prereq: 355 and 356.</td>
<td></td>
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<tr>
<td>435</td>
<td>Proseminar (1–4, max 12)</td>
<td>Prereq: perm. Intensive analysis of major author, literary genre, or theme. When subject is changed, student may re-enroll.</td>
<td></td>
</tr>
<tr>
<td>439</td>
<td>Grammatical Structure (4)</td>
<td>Prereq: 343 or perm. Selected problems in analysis and classroom presentation of German morphology and syntax.</td>
<td></td>
</tr>
<tr>
<td>441</td>
<td>Stylistics (4)</td>
<td>Prereq: 343 or perm. Advanced writing and stylistic analysis. Practice in variety of nonfiction prose techniques.</td>
<td></td>
</tr>
<tr>
<td>498</td>
<td>Independent Study in German (1–2, max 4)</td>
<td>Prereq: 8 credits at 300 level or perm of dept chair. Directed individual readings, discussion, and reports in language at advanced level. Does not count toward 400-level hrs required for major. Max imum of two credits may count toward minor.</td>
<td></td>
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<tr>
<td>111</td>
<td>Beginning Greek (4)</td>
<td>Grammar, vocabulary, and reading of ancient Greek. Students will be introduced to Ionic, Attic, and Koine (New Testament) dialects.</td>
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<tr>
<td>112</td>
<td>Beginning Greek (4)</td>
<td>Prereq: 111. Continuation of 111. See 111 for description.</td>
<td></td>
</tr>
<tr>
<td>113</td>
<td>Beginning Greek (4)</td>
<td>Prereq: 112. Continuation of 111–112. See 111 for description.</td>
<td></td>
</tr>
<tr>
<td>211</td>
<td>Intermediate Italian (4) (2C)</td>
<td>Prereq: 113 or 2–3 yrs h.s. Italian. (fall) 1st course of 3-qtr intermediate-level sequence.</td>
<td></td>
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<tr>
<td>212</td>
<td>Intermediate Italian (4) (2C)</td>
<td>Prereq: 211 or perm. (winter) Continuation of 211.</td>
<td></td>
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<tr>
<td>213</td>
<td>Intermediate Italian (4) (2C)</td>
<td>Prereq: 212 or perm. (spring) Continuation of 212.</td>
<td></td>
</tr>
<tr>
<td>215</td>
<td>Italian Prose and Poetry (4) (2H)</td>
<td>Prereq: 211. Continuation of 211. See 211 for description.</td>
<td></td>
</tr>
<tr>
<td>218</td>
<td>Demotic Greek (4)</td>
<td>Prereq: 251X. Continuation of demotic (modern) Greek.</td>
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</tr>
<tr>
<td>219</td>
<td>Demotic Greek (4)</td>
<td>Prereq: 252X. Continuation of demotic (modern) Greek.</td>
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<td>220</td>
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<td>221</td>
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<td>Prereq: 252X. Continuation of demotic (modern) Greek.</td>
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<tr>
<td>311</td>
<td>Greek Epic Poets (4)</td>
<td>Readings in Greek from Homer and Hesiod.</td>
<td></td>
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<tr>
<td>312</td>
<td>Greek Tragedy (4)</td>
<td>Readings in Greek from Aeschylus, Sophocles, and/or Euripides.</td>
<td></td>
</tr>
<tr>
<td>313</td>
<td>Readings in Greek Intellectual History (4)</td>
<td>Readings in Greek from Plato, Thucydides, and/or the Sophists.</td>
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<tr>
<td>314</td>
<td>Greek Historians (4)</td>
<td>Readings in Greek from Herodotus and Thucydides.</td>
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<td>316</td>
<td>The Greek New Testament and the Milieu of Early Christianity (4)</td>
<td>Readings in Greek from the New Testament, the early Greek fathers, and/or non-Christian writers of interest for the study of early Christianity.</td>
<td></td>
</tr>
<tr>
<td>340</td>
<td>Traditional Literature of Southeast Asia (3)</td>
<td>(fall) Survey of traditional literature of Southeast Asia in English.</td>
<td></td>
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<tr>
<td>345</td>
<td>Modern Literature of Southeast Asia (3)</td>
<td>(winter) Survey of modern literature of Southeast Asia in English.</td>
<td></td>
</tr>
<tr>
<td>369A</td>
<td>Women in Chinese Literature (4)</td>
<td>Introduction to Chinese language, culture, and society through reading in English translation of fictional representations of women in China.</td>
<td></td>
</tr>
<tr>
<td>334(A-Z)</td>
<td>Portuguese and Brazilian Literature in English (4)</td>
<td>Literature of Portugal or literature of Brazil in English translation. See schedule of classes for topics each quarter.</td>
<td></td>
</tr>
<tr>
<td>335(A-Z)</td>
<td>Italian Literature in English (4)(2H)</td>
<td>Famous literary works of best Italian authors, presented in English. See schedule of classes for topics each quarter.</td>
<td></td>
</tr>
<tr>
<td>336(A-Z)</td>
<td>Spanish Literature in English (4) (2H)</td>
<td>Topics may deal with either Spanish or Latin American literature. See schedule of classes for topics each quarter.</td>
<td></td>
</tr>
<tr>
<td>337(A-Z)</td>
<td>French Literature in English (4)(2H)</td>
<td>Literary works by authors of French expression, read and discussed in English. See schedule of classes for topics each quarter.</td>
<td></td>
</tr>
<tr>
<td>338(A-Z)</td>
<td>German Literature in English (4) (2H)</td>
<td>Survey of masterpieces of German literature, presented in English.</td>
<td></td>
</tr>
<tr>
<td>339(A-Z)</td>
<td>Russian Literature in English (4)</td>
<td>Survey of Russian literature from beginnings to revolution, presented in English.</td>
<td></td>
</tr>
<tr>
<td>111</td>
<td>Elementary Italian (4)</td>
<td>Prereq: 111 or equiv. (winter) Continuation of 111.</td>
<td></td>
</tr>
<tr>
<td>112</td>
<td>Elementary Italian (4)</td>
<td>Prereq: 112. (spring) Continuation of 112.</td>
<td></td>
</tr>
<tr>
<td>211</td>
<td>Intermediate Italian (4) (2C)</td>
<td>Prereq: 113 or 2–3 yrs h.s. Italian. (fall) 1st course of 3-qtr intermediate-level sequence.</td>
<td></td>
</tr>
<tr>
<td>212</td>
<td>Intermediate Italian (4) (2C)</td>
<td>Prereq: 211 or perm. (winter) Continuation of 211.</td>
<td></td>
</tr>
<tr>
<td>213</td>
<td>Intermediate Italian (4) (2C)</td>
<td>Prereq: 212 or 4-5 yrs h.s. Italian. (spring) Completion of 213 fulfills foreign language requirement of College of Arts and Sciences.</td>
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<td>341</td>
<td>Advanced Conversation and Composition (4)</td>
<td>Prereq: 213 or perm. (fall)</td>
<td></td>
</tr>
<tr>
<td>342</td>
<td>Advanced Conversation and Composition (4)</td>
<td>Prereq: 341 or perm.</td>
<td></td>
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</tbody>
</table>