986C. Counseling Practicum III

Fall, Winter, Spring. 3(0-3) 986B.

Supervised experience working with college students in a counseling relationship in the residence halls. Individual supervision, increased client contact hours, and participation in staff activities.

999. Research

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

ELECTRICAL ENGINEERING AND SYSTEMS SCIENCE*

College of Engineering

Electrical Engineering — E E

305. Electromagnetic Fields and Waves I

Fall, Winter. 3(3-0) MTH 215, PHY 288.

Vector analysis. Electrostatic fields: EM sources, scalar potential, Poisson's and Laplace's equations, dielectric media, capacitance, and energy storage. Boundary value problems for electrostatic fields.

306. Electromagnetic Fields and Waves II

Winter, Spring. 3(3-0) 305.

Magnetostatic fields; EM sources, vector potential, magnetic media, inductance, and energy storage. Time-varying fields and Maxwell's equations: energy conservation, potential theory, and radiation concepts.

307. Electromagnetic Fields and Waves III

Spring, Summer. 3(3-0) 306; 308 concurrently.

Application of Maxwell's equations: radiation, propagation, reflection, and power flow of plane EM waves; EM boundary value problems. Transmission line theory: transient and steady state waves, standing and traveling waves, reflections and standing-wave-ratio.

308. Fields and Waves Laboratory

Spring, Summer. 1(0-3) 306; 307 concurrently.

Experimental investigation of: charged particle motion in EM fields, dielectric and magnetic properties and materials, probing of currents and charges, and propagation of transient and steady-state waves. Digital computer solutions for EM field and wave problems.

311. Fundamentals of System Modeling

Fall, Winter. 3(3-0) MTH 334; PHY 288.

System measurements, signal representations, mathematical models for systems of lumped physical components, topological equations for electrical networks; linear graph theory and its application to modeling electrical, mechanical, hydraulic, and other systems.

312. Analysis of Linear Systems

Winter, Spring. 3(3-0) 311.

State Models for general systems; numerical and analytical solutions.

*Effective March 1, 1969.

313. Analysis of Large Scale Systems

Spring, Summer. 3(3-0) 312.

Stability, pulse and frequency response characteristics, analysis by Laplace and Z transforms, subassemblies of multi-terminal components.

321. Analog and Digital Computation Laboratory

Fall, Winter. 1(0-3) MTH 334, PHY 288; 311 concurrently.

Numerical solution of electrical systems problems, component modeling by digital computer, analog computer simulation.

345. Instrumentation and Computation Laboratory

Fall, Winter, Spring. 4(3-3) PHY 288.

Signal measuring and generating devices; accuracy and error considerations in laboratory measurements; terminal characteristics of components from measurements; use of analog computers.

374. Electronics I

Fall, Winter. 4(4-0) PHY 288.

Current, voltage and power. DC, AC and transient RLC circuit analysis. Resonance phenomena; bridges; nonlinear circuitry. Two-port networks and their equivalent circuits. Computer-aided analysis and design of circuits.

375. Electronics II

Winter, Spring. 4(4-0) 374.

Volt-ampere characteristics of the transistor. Voltage, current and power amplification. Stability and transient effects. Oscillators, operational amplifiers.

376. Electronics III

Spring, Summer. 3(3-0) 375.

Boolean algebra and logic circuits. Design, analysis, and evaluation of monostable, astable and bistable multi-vibrator circuits, logic circuits and systems. Aspects of reliability.

384. Electronics Laboratory I

Fall, Winter. 1(0-3) 374 concurrently.

Experimental and measurement procedures, as appropriate to topics covered in 374.

386. Electronics Laboratory II

Spring, Summer. 1(0-3) 376 concurrently.

Experimental investigation of topics covered in 375 and 376. Computer-aided analysis and design of electronic circuits.

403. Special Problems

Fall, Winter, Spring, Summer. 1 to 4 credits. Approval of department.

Investigation of a topic in electrical circuits or systems compatible with the student's prerequisites, interest, and ability.

415. Control Systems

Fall. 3(3-0) 313 or M E 455, MTH 334.

Formulation of automatic control problems; review of modeling method; specifications, controllability and stability; controller design via root locus and state-vector methods; survey of digital control.

416. Control System Design

Winter. 3(3-0) 415.

Realization of linear controllers, consistent models for plant and computer sampling, algorithms for digital control, organization of digital controllers.

418. Introduction to Network Synthesis

Spring. 3(3-0) 313.

Overview: specification, approximation, synthesis. Physical realizability of passive two-element kind one-port and two-port functions. Foster and Cauer one-port syntheses. Lattice, ladder and cascade two-port syntheses. Selected active network synthesis.

435. Guided Transmission Systems

Fall. 3(3-0) 308.

Electric circuit theory from EM field theory. Guided wave theory: normal modes, propagation characteristics, power transport, wave impedances, traveling and standing waves, rectangular and circular waveguides. Electromagnetic resonators: frequency and Q.

436. Microwave Networks and Antennas

Winter. 3(3-0) 435; 438 concurrently.

Circuit theory for wave-guiding systems: impedance description of microwave one and N-port networks, scattering matrix, excitation and coupling. Radiation and scattering: radiation fields, fields and impedance of cylindrical antennas and arrays, microwave antennas.

437. Microwave Electronics and Plasma

Spring. 3(3-0) 436; 439 concurrently.

Electron dynamics; field-particle interactions; space-charge waves; cyclotron waves; klystron; magnetron; traveling-wave amplifier; quadrupole amplifiers; microwave solid-state devices; gas discharges; plasma; waves in plasma.

438. Transmission and Radiation Laboratory

Winter. 1(0-3) 435; 436 concurrently.

Microwave transmission and radiation laboratory. Measurement of frequency, wavelength, standing waves, impedance, and power. Experiments on transmission lines, waveguides, cavity resonators, microwave circuits, and circuit and radiation properties of antennas.

439. Microwave Electronics and Plasma Laboratory

Spring. 1(0-3) 438; 437 concurrently.

Experimental investigations on topics from 437. Laboratory experiments on klystron characteristics, traveling wave amplifier, microwave semiconductor oscillator, plasma measurements, and plasma-field interactions.

455. Deterministic Communication Systems

Fall. 3(3-0) 374 or approval of department.

Communication systems. Representation of signals in time and frequency domain. Processing of signals by linear, simple nonlinear and time-variant systems. Linear and nonlinear, analog and digital modulation and demodulation; for example, AM, FM, PCM.

456. Applied Probability in Communication Theory

Winter. 3(3-0) 455 or approval of department.

Probability theory as applied in the study of communication systems. Representation of random signals and noise as stochastic processes. Autocorrelation and spectral density.

457. Introduction to Statistical Communication Theory

Spring. 3(3-0) 456; 467 concurrently.

Representation, processing and filtering of random signals. Performance of analog, linear and nonlinear modulation systems with noise. Optimal digital communication systems.

460. Introduction to Electromagnetics
Spring. 3(3-0) PHY 288.

Electric and magnetic fields; boundary conditions; Maxwell's equations. Electromagnetic waves. Wave guides and cavities. Charged particles in an electromagnetic field.

466. Control Systems Laboratory
Winter. 1(0-3) 415; 416 concurrently.

Experiments in control of processes with a digital controller. Simulation of control systems.

467. Communication Theory Laboratory
Spring. 1(0-3) 456; 457 concurrently.

Experimental investigations on communication theory and information transmission topics from 455, 456, and 457.

474. Physical Properties of Electronic Devices I
Fall. 3(3-0) 376.

Energy levels in atoms and single crystals. Density of states and elementary statistics. Transport phenomena in semiconductors. Junctions. Computer-aided analysis of transport phenomena in semiconductors.

475. Physical Properties of Electronic Devices II
Winter. 3(3-0) 474.

Bulk semiconductors effects and devices. Single-junction and multiple-junction devices. Sources of optical radiation, including lasers. Methods of detecting optical radiation. Solar cells. Thermal and electromechanical effects and devices.

476. Physical Properties of Electronic Devices III
Spring. 3(3-0) 475.

Continuation of topics covered in 475. Aspects of integrated-circuit techniques.

484. Electronic Devices Laboratory I
Fall. 1(0-3) 474 concurrently.

Introduction to materials handling and preparation techniques. Fabrication of electronic devices. Measurement of bulk properties of materials. Computer-aided analysis of transport phenomena in semiconductors.

485. Electronic Devices Laboratory II
Winter. 1(0-3) 475 concurrently.

Materials preparation techniques. Fabrication of electronic devices. Measurement of bulk properties of materials. Computer-aided analysis of semiconductor devices.

801. Special Problems
Fall, Winter, Spring, Summer. 1 to 4 credits. Approval of department.

Investigation of a topic in electrical engineering compatible with the student's prerequisites, interest, and ability.

811. Noise and Fluctuation Phenomena
Spring of even-numbered years; Summer of odd-numbered years. 3(3-0) Approval of department.

Nyquist formulation of thermal noise; noise phenomena associated with electron tubes, transistors, beam and parametric devices, amplifiers, mixers, and detectors; techniques and equipment for noise measurements.

816. Quantum Electronics
(988.) Fall. 3(3-0) Approval of department.

Quantized wave motion; Hamiltonian function and operator; hydrogen atom and energy states; transition probabilities; spontaneous and induced transitions; statistical physics; transport phenomena; band theory applied to conductors, semi-conductors and insulators.

818. Electrical Properties of Materials I
Winter of odd-numbered years. 3(3-0) 816.

Study of atomic and molecular properties affecting the conductivity, permittivity, permeability, absorptivity and radioactivity of materials, classical and quantum considerations.

819. Electrical Properties of Materials II
Spring of odd-numbered years. 3(3-0) 818.

Temperature and frequency effects on conduction, dielectric constant, and dielectric loss; temperature, frequency and bias effects on the behavior of ferrite materials; stimulated emission and absorption in materials.

831. Foundations of Network Synthesis
Fall. 3(3-0) Approval of department.

One-port networks; RL, RC, LC and RLC networks; driving point immitances; positive real properties; realization procedures.

832. Filter Synthesis I
Winter. 3(3-0) 831.

Two-port LC networks; transmission characteristics; filter design techniques based on image parameters; Cauer filters.

833. Filter Synthesis II
Spring. 3(3-0) 832.

Scattering parameters; Butterworth, Chebyshev and elliptic filters, phase equalizers synthesis based on insertion functions.

835. Electromagnetic Theory I
(804.) Fall. 3(3-0) Approval of department.

Physical concepts and mathematical solution of Maxwell equations; boundary conditions; force and energy equations; potential equations; Green's function; wave equations; radiation and propagation of electromagnetic waves.

836. Electromagnetic Theory II
Winter. 3(3-0) 835.

Formulation of electric-circuit theory from viewpoint of electromagnetic theory; caluclation of impedance; propagation of electromagnetic wave in isotropic and anisotropic media; skin effects; boundary value problems.

837. Guided Transmission Systems
(812.) Spring. 3(3-0) 835.

Electromagnetic fields in open-wire lines, coaxial lines and wave guides; power and energy relationships; orthogonality properties; normal modes; resonant cavities; modes of propagation in stratified media; microwave circuits.

845. Mathematical Models for Random Phenomena
Fall, Summer. 3(3-0) Approval of department.

Generation of mathematical models that employ probabilistic notions to describe control, communication, and related systems, with emphasis on distributions of random variables, conditioning, and properties of random sequences.

846. Analysis of Random Time Functions
Fall, Winter. 3(3-0) 845.

Mathematical models for time-dependent random phenomena; properties of correlation functions and spectral densities; stationarity and ergodicity; response of linear systems to random inputs; introduction to applied harmonic analysis.

847. Communication Systems
Winter, Spring. 3(3-0) 846.

Comparative analysis of modulation systems; optimal relation between bandwidth and signal-to-noise ratio; telemetry and radar systems.

848. Physical Electronics
Fall. 3(3-0) Approval of department.

Types of electron emission; electron motion in electromagnetic fields; beam focusing; longitudinal and transverse beam waves; concepts of interaction between electrons and fields; basic principle of parametric electronics.

849. Microwave Electronics
(813.) Winter. 3(3-0) 835, 848.

Principles of microwave generators, including klystrons, magnetrons, traveling-wave tubes and particle accelerators; non-linear electron-wave interactions; crossed-field devices; solid state microwave electronics.

850. Ionized Gases
Spring. 3(3-0) 835 or PHY 448. Interdepartmental with the Astronomy Department.

Elastic collision processes; Boltzmann equation; moment equations; basic plasma phenomena; motion of a charged particle in electrical and magnetic field; individual and collective charged particle behavior.

852. Semiconductor Devices
Winter. 3(3-0) 816.

Applications of the diffusion and continuity equations to semiconductor devices; delineation of the device terminal properties including transient operation.

853. Semiconductor Applications
Spring. 3(3-0) 852.

Equivalent circuits; analysis of circuit operation including high frequency effects, noise properties, nonlinear effects.

899. Research
(EGR 899.) Fall, Winter, Spring, Summer. Variable credit. Approval of department.

911. General Automata Theory I
(981.) Fall of odd-numbered years. 3(3-0) CPS 453 or 825 or approval of department. Interdepartmental with and administered by the Computer Science Department.

Characterization of machines and programs as automata; mathematical decomposition of finite automata.

912. General Automata Theory II
(982.) Winter of even-numbered years. 3(3-0) 911. Interdepartmental with and administered by the Computer Science Department.

Reliability and redundancy of finite automata. Probabilistic sequential machines. Languages definable by probabilistic and deterministic automata. Axioms for equivalence of regular expressions.

913. General Automata Theory III
(983) Spring of odd-numbered years. 3(3-0) 912. Interdepartmental with and administered by the Computer Science Department.

Degrees of difficulty of computation. Models of parallel computation. Iterative automata.

926. Antenna Theory I
Winter of even-numbered years. 3(3-0) 837.

Linear antennas; cylindrical dipole antennas as radiating, receiving and scattering elements; current and charge distributions on antennas; electromagnetic fields of antennas; coupled antennas, linear antenna arrays.

927. *Antenna Theory II*

Spring of even-numbered years. 3(3-0) 926.

Microwave antennas; slot antennas; slot wave guide arrays; horn and reflector-type antennas; frequency independent antennas; pattern theory.

928. *Microwave Laboratory*

Summer of even-numbered years. 3(2-3) 837, 927, 989.

Experiments on transmission line systems; scattering measurements; antenna measurements; interaction of electromagnetic waves with plasmas; radiation in plasmas; experiments on electron tubes and on lasers.

945. *Mean Square Filtering and Prediction*

Fall of even-numbered years. 3(3-0) 845.

Stationary and ergodic ensembles of signals; correlation functions; Wiener's solution to optimum filtering and prediction problems.

946. *Extraction of Signals from Noise*

Winter of odd-numbered years. 3(3-0) 945.

Auto-correlation and cross-correlation in detecting signals in noise; application of decision theory to the detection problem; measurement of message characteristics in noise.

947. *Space Communications*

Spring of odd-numbered years. 3(3-0) 847, 946.

Communication theory and switching theory applied to the study of communications in space; rate of information and error probability in pulse modulation systems for long distance communications.

955. *Microelectronics I*

Fall of odd-numbered years. 3(3-0) 853.

Basic physical principles underlying the operation, design, and fabrication of microelectronic devices.

956. *Microelectronics II*

Winter of even-numbered years. 3(3-0) 955.

Miniaturized components; thin-film networks; solid-state circuits and operational limitations.

957. *Semiconductor Switching Circuits*

Spring of even-numbered years. 3(2-3) 956 or approval of department.

Switching design considerations; theory and application of device characteristics in switching circuits. Laboratory experiments using transistors and microcircuits.

975. *Quantum Electromagnetics*

Winter of odd-numbered years. 3(3-0) 816.

Tensors; four-vector formulation of classical electromagnetics; relativistic electromagnetics; Lagrangian ond Hamiltonian—classical and relativistic; Schrodinger's equation—classical and relativistic; quantization of wave fields, hydrogen atoms.

976. *Lasers and Masers*

Spring of odd-numbered years. 3(3-0) 975.

Coherence, emission, absorption and amplification of radiation; energy levels for optically active materials; threshold, band width, excitation modes and other operating characteristics; applications and recent developments.

989. *Waves and Radiations in Plasmas*

Fall of even-numbered years. 3(3-0) 850. Interdepartmental with the Astronomy Department.

Plasma oscillation; interaction, electromagnetic fields with plasmas, wave propagation in magnetionic media; plasma sheath; radiation of electric source in incompressive and compressive plasmas; electroacoustic waves; magnetohydrodynamics; research topics in plasmas.

990. *Electromagnetic Wave Propagation I*

Winter of odd-numbered years. 3(3-0) 835.

Electromagnetic plane waves, collimated beams and pulses, phase velocity, group and signal velocity, velocity of energy transport, propagation of plane waves in homogeneous dispersive media, reflection of spherical wave from homogeneous boundaries, propagation in wave guides with complex boundaries.

991. *Electromagnetic Wave Propagation II*

Spring of odd-numbered years. 3(3-0) 990.

Propagation in monotonically stratified media, propagation in turbulent media (scattering), propagation in stratified media, propagation in quasi-periodic media, Brillouin scattering, pulses in inhomogeneous media, propagation in moving media, complex Doppler effect, coupling between Maxwell equations and continuum equations, depolarization of EM waves.

999. *Research*

(EGR 999.) Fall, Winter, Spring, Summer. Variable credit. Approval of department.

Systems Science SYS

465. *Process Optimization Methods*

Spring. 3(3-0) MTH 215, knowledge of linear algebra. Interdepartmental with and administered by the Chemical Engineering Department.

Methods for determining optimum design and operating policies of systems of varying complexity. Includes classical methods, mathematical programming and modern methods.

475. *Introduction to Operations Research*

Winter. 4(4-0) MTH 215, CPS 120. Interdepartmental with and administered by the Agricultural Engineering Department.

Methodology and basics of operations research; formulation and analysis of probabilistic models of inventory, waiting line, and reliability processes; random process simulation and network planning models.

801. *Special Problems*

Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll for a maximum of 8 credits. Approval of department.

810. *Introduction to Linear System Theory*

(812.) Fall. 3(3-0) MTH 214. Interdepartmental with Computer Science Department and Social Science (College of).

A first course in system theory for students from a range of disciplines. Mathematical representation of system variables, transform and state space method of analysis, introduction to control theory, applications to physical, economic and social systems.

811. *System Methodology and Simulation*

Winter. 3(3-0) 810, STT 441. Interdepartmental with the Computer Science Department and Social Science (College of).

Problem definition, design of abstract models for system design and control, simulation of systems described by differential and difference equations, generation of random variables, simulation of discrete object stochastic systems, simulation languages, applications to physical, economic and social systems.

813. *System Project*

Spring. 3(1-6) 811. Interdepartmental with the Computer Science Department and Social Science (College of).

Individual or team application of simulation methods to system design and/or management.

825. *Foundations of Systems Science*

Spring, Summer. 4(4-0) MTH 215 and 334.

Basic definitions; set theory, graph theory, matrices and vector differential and difference equations in system theory; solutions in terms of functions of matrices and operational calculus.

826. *Linear Concepts in Systems Science*

Fall. 4(4-0) 825.

State-space and frequency domain models of interconnected systems; solution of continuous and discrete-time linear systems; response characteristics; stability.

827. *Nonlinear Concepts in Systems Science*

Winter. 4(4-0) 826.

Existence, uniqueness and stability; autonomous systems and the phase space; linearization, perturbation, describing functions and harmonic balance procedures; numerical solutions.

828. *Introduction to Static and Dynamic Optimization and Control*

Summer. 3(3-0) MTH 215, 334, or approval of department.

Problem formulation and classification; cost functionals; application of Lagrange multipliers, gradient methods, mathematical programing, direct search and other optimization techniques; necessary conditions for optimal control of constrained dynamic systems.

847. *Analysis of Stochastic Systems*

Spring. 3(3-0) E E 846.

Equilbrium properties of non-stationary random processes; problems or estimation, filtering and prediction; sequential and recursive decision schemes; applications of random process theory to system modeling.

888. *Hybrid Computation*

Spring. 3(3-0) Approval of department.

Hybrid programing techniques, applications in simulation design, control and optimization.

899. *Research*

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

961. *Optimal Control Theory I*

Fall. 3(3-0) 827, 828 or approval of department; MTH 426.

Formulation of the general control problem; controlability, observability and normality in discrete-state and continuous-state systems; performance functionals; typical control problems.

962. *Optimal Control Theory II*

Winter. 3(3-0) 961.

Optiman control theory in continuous-state and discrete-state systems; necessary and sufficient conditions for optimal solutions, geometric interpretations relation to calculus of variations; typical applications.

963. *Optimal Control Theory III*

Spring. 3(3-0) 962 or approval of department.

Topics selected among: computational methods for optimal controls (solution of selected two-point boundary value problems); stochastic control theory; state estimation, Kalman filtering and related statistical methods; differential game theory.

999. Research

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

ENGINEERING EGR

College of Engineering

160. Engineering Communications

Fall, Winter, Spring. 4(1-6) MTH 108 or 111 or concurrently.

Engineering graphics, a means used by engineers to communicate their ideas to others. Freehand sketching, descriptive geometry, and graphical, numerical and computer problem solutions.

161. Mechanical Drawing

Fall, Winter, Spring. 2(0-4)

Lettering and use and care of instruments. Orthographic projection, working drawings, machine sketching and isometric drawing.

162. Mechanical Drawing

Fall, Winter, Spring. 2(0-4) 160 or 161.

Continuation of 161 with emphasis on freehand lettering and sketching, advanced working drawings.

200. Technology and Society

Winter. 3(3-0) ATL 111.

An attempt to describe and analyze portions of current technology and its desired and undesired consequences; an exploration of avenues for assessing such consequences for future technologies.

260. Machine Drawing

Fall, Winter, Spring. 3(0-6)

Advanced orthographic projection, detail, and assembly drawing, sections and conventions, tracings, illustration and other pictorial drawings of mechanical elements.

263. Structural Drawing

Winter. 3(0-6) An engineering graphics course.

A comprehensive study of space planning relative to residential and light-commercial interiors. Building materials, fixtures, and mechanical equipment will be studied with respect towards application and installation.

267. Architectural Drafting I

Fall, Winter, Spring. 3(0-6)

House construction detailing. Analysis and drawing of typical standard details.

268. Descriptive Geometry

Fall. 3(2-2) 160, 161.

Problems involving relations of points, lines, and planes. Intersections, developments, coplanar, and noncoplanar vectors.

270. Computer Graphics

Spring. 3(3-0) 160 or 161; CPS 110 or 120 or LBC 125; or approval of department.

Use of computer controlled display systems for the solution of multidimensional problems.

364. Architectural Drafting II

Winter. 3(0-6) 267.

Functional and standard procedure in the layout of floor plans in traditional and modern houses. Rendered plot plan and required details.

365. House Planning

Fall, Winter, Spring. 3(1-4)

Elementary house architecture. Drawing plans from sketches. Kitchen planning, house styles, elements of design, financing, heating, lighting.

366. Architectural Perspective Drawing

Fall. 3(0-6) Any engineering graphics course.

One-point and two-point perspective, revolved plan and measuring line methods. Pencil rendering, problems in shade and shadows. House model to scale, optional.

463. Architectural Drafting III

Spring. 3(0-6) 364 or 365.

Traditional and modern elevations. One- and two-point rendered perspective. Functional plans drawn in 364 or 365 required.

480. Special Problems

Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll for a maximum of 8 credits. Approval of department.

ENGLISH ENG

College of Arts and Letters

091. English for Foreign Students—Elementary

Fall, Winter, Spring, Summer. Zero credit. (3(3-0) to 15(25-0))†. English language proficiency examination.

Spoken structures, pattern practice, reading, writing and laboratory in the English language for foreign students on the elementary level.

092A. English for Foreign Students—Low Intermediate

(092.) Fall, Winter, Spring, Summer. Zero credit. (3(5-0) to 15(25-0))†. English language proficiency examination.

Spoken structures, pattern practice, reading, writing and laboratory in the English language for foreign students on the low-intermediate level.

092B. English for Foreign Students—High Intermediate

(092.) Fall, Winter, Spring, Summer. Zero credit. (3(5-0) to 15(25-0))†. English language proficiency examination.

Spoken structures, pattern practice, reading, writing and laboratory in the English language for foreign students on the high-intermediate level.

093. English for Foreign Students—Advanced

Fall, Winter, Spring, Summer. Zero credit. (3(5-0) to 15(25-0))†. English language proficiency examination.

Spoken structures, pattern practice, reading, writing and laboratory in the English language for foreign students on the advanced level.

094. English for Foreign Students—Supplementary

Fall, Winter, Spring, Summer. Zero credit. (3(5-0) to 6(10-0))†. English language proficiency examination.

Composition in the English language for foreign students on the supplementary level.

101. Freshman Composition I

Fall. 4(4-0) Arts and Letters Freshmen only.

A student or experience-centered writing course that explores personal and public modes of writing and composing. An option to ATL for Arts and Letters students.

†See page A-2 item 3

102. Freshman Composition II

Winter. 5(5-0) Arts and Letters Freshmen only.

Continuation of 101.

200H. Honors Work

Fall, Winter, Spring. 1 to 16 credits. Approval of department.

201. Nature of Language

Fall, Winter, Spring, Summer. 3(3-0) ATL 113.

Various aspects of language—phonology and orthography; morphology, semantics and the lexicon; syntax; and dialects—with special reference to American English.

205. Introduction to Shakespeare

Fall, Winter, Spring. 3(3-0) ATL 113.

A study of selected plays illustrating the powers of England's greatest writer.

206. Forms of Literature

Fall, Winter, Spring, Summer. 3(3-0) Required of majors and minors. Open to Freshmen.

Major forms of prose fiction, designed to reveal artistic problems met and solved by these forms. Prepares students for advanced literary study by acquainting them with the conventions of various literary forms, by providing a critical vocabulary and by furnishing experience in reading and writing critical evaluations of outstanding literary works from all historical periods.

207. Forms of Literature

Fall, Winter, Spring, Summer. 3(3-0) Required of majors and minors. Open to Freshmen.

Major forms of drama, designed to reveal artistic problems met and solved by these forms.

208. Forms of Literature

Fall, Winter, Spring, Summer. 3(3-0) Required of majors and minors. Open to Freshmen.

Major forms of poetry, designed to reveal artistic problems met and solved by these forms.

213. Expository Writing

Fall, Winter, Spring, Summer. 3(3-0) ATL 113.

Practice in informative writing to develop mastery of a clear, accurate style and of practical, basic expository forms.

214. Composition for Secondary English Teachers

Fall, Winter Spring. 4(3-1) ATL 113; Sophomore English education majors or written approval of department.

Writing practice in various modes such as personal narrative and description, the familiar essay, drama, poetry, and fiction. Exercises in creative dramatics. Discussion of the process of composing and the teaching of oral and written composition in junior and senior high schools.

228A. Fiction Writing

Fall, Winter, Spring, Summer. 4(4-0) 206 and written approval of department.

The writing of short fiction. Classes and individual conferences. Approval to enroll requires a conference with the instructor and will usually be on the basis of manuscripts submitted to him.

228B. Fiction Writing

Fall, Winter, Spring, Summer. 4(4-0) Written approval of department.

The writing of fiction. Classes and individual conferences. Approval to enroll requires a conference with the instructor and will usually be on the basis of manuscripts submitted to him.