971B. Planning, Evaluation, and Decision Making in Post-secondary Education
Spring of even-numbered years. 3(3-0)
Analysis of planning, evaluation, and decision making in the leadership and management of post-secondary institutions. Integration of program, personnel, facility, and enrollment planning related to factors such as budgeting and accreditation.
QA: EAD 971C

971C. Higher Education Finance
Spring of odd-numbered years. 3(3-0)
Revenue sources of institutions of higher education. Restrictions and conditions placed upon funds. Administrative structures used to obtain and manage funds.
QA: EAD 970B

971D. Institutional Advancement in Higher Education
Fall of odd-numbered years. 3(3-0)
Issues and strategies affecting institutional development. Governmental relations, admissions, alumni relations, and general administration.
QA: EAD 870C, EAD 870J

990. Independent Study
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course.
Advanced individual study in an area of K-12 administration or higher, adult, and lifelong education.

991A. Special Topics in K-12 Administration
Fall, Spring, Summer. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.

991B. Special Topics in Higher, Adult, and Lifelong Education
Fall, Spring, Summer. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.

994. Laboratory and Field Experience in Educational Administration
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Open only to doctoral students.
Supervised advanced graduate practica, observations, internships, or externships in K-12 administration and in higher, adult, and lifelong education.

995. Research Practicum in Educational Administration
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course.
R: Open only to doctoral students. Approval of department.
Supervised research practicum. Design, execution, analysis, presentation, critique, and revision of research projects.

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 36 credits in all enrollments for this course.
R: Open only to Ph.D. students.

ELECTRICAL ENGINEERING EE

Department of Electrical Engineering
College of Engineering

200. Electric Circuits
Fall, Spring. 4(4-0)
P: CPS 130 or CPS 131 or CPS 230; MTH 133. R: Open only to Engineering students.
Resistive circuits. Loop and nodal analysis. Network theorems. Capacitor and inductor circuits. Transient analysis. Forced response. Sinusoidal steady-state response. Frequency response. Introduction to computer-aided analysis.
QP: MTH 113 QA: EE 300, EE 301

302. Electronic Circuits
Fall, Spring. 4(3-3)
P: EE 200. R: Open only to Electrical Engineering, Computer Engineering, and Computer Science majors.
Volt-ampere characteristics of diodes and transistors. SPICE modeling. Differential, multistage and integrated circuit amplifiers. High frequency effects. Electronic test equipment and verification of principles.
QP: EE 301, MTH 215 QA: EE 302, EE 303, EE 304

305. Electromagnetic Fields and Waves I
Fall, Spring. 3(3-0)
P: MTH 235, PHY 184. R: Open only to Electrical Engineering, and Computer Engineering majors.
Vector analysis. Static electric field and scalar potential. Dielectric materials. Electric force and energy. Potential problems. Steady currents, magnetic field and vector potential. Magnetic materials and circuits. Magnetic force and torque.
QP: MTH 310, PHY 288 QA: EE 305, EE 306

306. Electromagnetic Fields and Waves II
Spring, Summer. 4(3-3)
P: EE 305. R: Open only to Electrical Engineering and Computer Engineering majors.
Faraday's law. Maxwell's equations. EM energy conservation. Wave equations and EM waves. Transmission lines. Transient waves. Travelling and standing waves. EM plane waves. EM radiation and antennas.
QP: EE 305, EE 306 QA: EE 307, EE 308

320. Energy Conversion and Power Electronics
Fall, Spring. 3(3-0)
P: EE 302, EE 305. R: Open only to Electrical Engineering and Computer Engineering majors.
Power and energy. Magnetics and transformers. Elementary and induction machines. Power semiconductors. Controlled rectifiers and inverters. Power supplies and motor drives.
QP: EE 301, EE 306 QA: EE 320

330. Digital Logic Fundamentals
Fall, Spring, Summer. 3(3-0)
P: CPS 130 or CPS 131 or CPS 230. R: Open only to College of Engineering majors.
Switching algebra, combinational logic, minimization. Programmable logic devices. Sequential system fundamentals, elements, circuits. Arithmetic operations and circuits. Memory elements and systems. Hierarchical structures. Design problems.
QP: CPS 251 QA: EE 330

331. Microprocessors and Digital Systems
Fall, Spring. 4(3-3)
P: CPS 230, EE 330. R: Open only to Electrical Engineering, Computer Engineering, and Computer Science majors. Not open to students with credit in CPS 320.
Microcomputers. Microprocessor architecture. Addressing modes. Assembly language programming. Parallel and serial input and output. Interfacing to memory. Interrupts. Direct Memory Access. Coprocessors. Peripheral device controllers. Applications, design
QP: E E 330 QA: CPS 311

345. Electronic Instrumentation and Systems
Fall, Spring, Summer. 3(2-3)
P: MTH 235, PHY 184. R: Open only to College of Engineering majors except Electrical Engineering and Computer Engineering.
Electrical and electronic components, circuits and instruments. Circuit laws and applications, frequency response, operational amplifiers, semi-conductor devices, digital logic, counting circuits.
QP: PHY 288 QA: EE 345

360. Signals and Linear Systems
Fall, Spring. 4(4-0)
P: EC 200, MTH 235. R: Open only to Electrical Engineering, Computer Engineering, and Computer Science majors.
Continuous and discrete signals and systems. Convolution, impulse response, system classifications, state variables, differential and difference equations. Fourier series, Fourier transform, Laplace transform. Z-transform. Transfer functions and stability.
QP: MTH 310 QA: EE 315, EE 417, EE 355

410. Digital Electronics
Fall, Spring. 3(3-0)
P: EE 302, EE 330. R: Open only to Electrical Engineering, Computer Engineering, and Computer Science majors.
Transistor switch models. Device simulation models. Logic family characteristics. Latches, flip-flops, timers, memory circuits, standard cells. Gate arrays, programmable logic devices.
QP: EE 330, EE 302 QA: EE 410

411. Electronic Design Automation
Spring. 3(3-0)
P: CPS 320 or EE 331; EE 410. R: Open only to Electrical Engineering, Computer Engineering, and Computer Science majors.
Electronic design hierarchy and the role of methodology. Application specific integrated circuits. Hardware descriptive languages. Behavioral and structural models. Semicustom design. Design algorithms. Design project, presentation and reports.
QP: CPS 311, EE 410 QA: EE 411

413. Control Systems
Fall, Spring. 3(3-0)
P: EE 360. R: Open only to Electrical Engineering, Computer Engineering, and Computer Science majors.
Analysis and design of control systems using transfer functions and state variable methods. Design of digital controllers. Microprocessor implementation.
QP: EE 315, EE 355 QA: EE 413, EE 415

418. Algorithms of Circuit Design
Fall. 3(3-0)
P: EE 302. R: Open only to Electrical Engineering and Computer Engineering majors.
Design of analog electrical circuits, filter functions, ladder synthesis, inductor simulation. Vector Newton-Raphson method. Lossy inductance and capacitance. Statistical tolerance analysis. Optimization by multidimensional search. Software algorithms.
QP: EE 302 QA: EE 418

421. Power System Analysis
Spring. 4(3-3)
P: EE 320. R: Open only to Electrical Engineering and Computer Engineering majors.
Synchronous machines: models and measurements of power components. Symmetrical components. Short circuit analysis and equipment protection. Load flow. Voltage and frequency control. Operation and planning of power systems.
QP: EE 320 QA: EE 421, EE 423

435. Electromagnetic Waves and Applications
Fall. 4(3-3)
P: EE 306. R: Open only to Electrical Engineering and Computer Engineering majors.
Open and closed-boundary waveguides. Resonators. Microwave circuit theory. Scattering parameters. Electromagnetic radiation. Properties of antennas. Wave propagation. Measurement of antenna characteristics. Computer-aided design and testing.
QP: EE 307, EE 308 QA: EE 435, EE 436, EE 438

457. Statistical Communication Systems
Spring. 4(3-3)
P: EE 360, STT 351. R: Open only to Electrical Engineering and Computer Engineering majors.
Representation, processing, filtering of random signals. System performance with noise. Optimal digital communication systems. Modulation, detection, coding, information. System design applications in telecommunications, radar, signal processing.
QP: EE 355, EE 456 or STT 441 or STT 351 QA: EE 457, EE 467

466. Digital Signal Processing and Filter Design
Fall. 3(3-0)
P: EE 360. R: Open only to seniors and graduate students in Electrical Engineering and Computer Engineering.
Discrete Fourier transforms, sampling theorem, circular convolution, Z-transforms. Design of infinite impulse resistance filters using prototypes and algorithmic methods. Design of finite impulse resistance filters by windowing, frequency sampling.
QP: EE 355, EE 315 QA: EE 466

474. Principles of Electronic Devices
Fall, Spring. 3(3-0)
P: EE 302, EE 305. R: Open only to Electrical Engineering and Computer Engineering majors.
Energy levels in atoms. Crystal properties, energy bands and charge carriers, semiconductors, transport properties of bulk materials. P-n junction diodes, bipolar transistors, field effect transistors.
QP: EE 302, EE 305 QA: EE 474

476. Electro-Optics
Fall. 3(2-3)
P: EE 306, EE 474. R: Open only to Electrical Engineering and Computer Engineering majors.
Operating principles and applications of high frequency and photonic devices including impatt, Gunn, photodetector, light-emitting diodes, semiconductor laser devices. Photonic device applications to fiber optic systems.
QP: EE 474, EE 307 QA: EE 477

481. Capstone: Professionalism, Communication and Ethics
Fall, Spring. 1(1-0)
C: EE 482 or EE 483 or EE 484 or EE 485 R: Open only to seniors in Electrical Engineering and Computer Engineering.
Reinforces capstone design course with examination of issues in professionalism and ethics. Technical writing.

482. Capstone: Computer System Design
Spring. 4(3-3)
P: EE 302, EE 331 or CPS 320; C: EE 481 R: Open only to Electrical Engineering and Computer Engineering majors.
Design of single board computers. Microprocessor emulation systems. Bus interface requirements. Data transfer. I/O controller design. Interrupt structure. Analog/digital interfacing. Logic analyzers.
QP: EE 302, CPS 311 QA: EE 431

483. Capstone: Integrated Circuit Design and Fabrication
Spring. 4(3-3)
P: EE 474; C: EE 481 R: Open only to Electrical Engineering and Computer Engineering majors.
Processing fundamentals and process simulations. Comparison of current metal oxide semiconductors and bipolar technologies and their limitations. Layout design rules and methodology. Packaging and yield.
QP: EE 474 QA: EE 871, EE 478

484. Capstone: Applications of Analog Integrated Circuits
Spring. 4(3-3)
P: EE 302; C: EE 481 R: Open only to Electrical Engineering and Computer Engineering majors.
Circuit design using analog integrated circuits. SPICE macromodeling. Operational amplifiers, comparators, timers, regulators, multipliers and converters. Design project with hardware and software verification.
QP: EE 302 QA: EE 475, EE 480, EE 304

485. Capstone: Digital Control and Robotics
Spring. 4(3-3)
P: EE 413, EE 330; C: EE 481 R: Open only to Electrical Engineering and Computer Engineering majors.
Robot classifications, kinematics, trajectory planning, digital controller design. Design and implementation of sensor-based robots.
QP: EE 415, EE 330 QA: EE 416

490. Independent Study
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course.
R: Approval of department.
Independent study of a topic in electrical engineering or computer engineering.
QA: EE 495

491. Special Topics
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Open only to Electrical Engineering and Computer Engineering majors.
Investigation of special topics in electrical engineering or computer engineering.

499. Undergraduate Research
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 4 credits in all enrollments for this course.
R: Approval of department.
Independent undergraduate research in contemporary areas of electrical engineering or computer engineering.
QA: EE 499

801. Independent Study
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course.
R: Approval of department.
Independent investigation of a topic in electrical engineering compatible with the student's prerequisites, interest, and ability.
QA: EE 801

802. Selected Topics
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Investigation of special topics in electrical engineering.
QA: EE 801

809. Algorithms and Their Hardware Implementation
Fall. 3(3-0) Interdepartmental with Computer Science.
Arithmetic, signal processing, and image processing algorithms. Array structures: systolic architecture, data flow structure, neural network architecture. Performance analysis.
QA: EE 809

813. Logic Design Principles
Spring. 3(3-0) Interdepartmental with Computer Science.
Behavioral modeling. Combinational circuit analysis and design. Sequential-circuit analysis and synthesis. Design for testability. Semicustom and MSI design.
QA: EE 813

823. Power System Stability and Control
Fall of even-numbered years. 3(3-0)
P: EE 826.
Analysis and simulation of small and large disturbance stability of power systems. Generator, exciter, voltage regulator models. Design of excitation systems and power system stabilizers.
QP: EE 826 QA: EE 823, EE 820

824. Power System Operation and Control
Fall of odd-numbered years. 3(3-0)
P: EE 421; STT 351.
Operation planning of power systems including load-flow, unit commitment, production cost methods. On line operation and control including automatic generation control, economic dispatch, security assessment, state estimation.
QP: EE 421, EE 456, STT 441 QA: EE 824

825. Alternating Current Electrical Machines and Drives
Spring of odd-numbered years. 3(3-0)
P: EE 320.
Analysis, modeling and design of synchronous, induction, and switched reluctance machines. Design drives for motion control and power system applications.
QP: MTH 424, EE 320 QA: EE 825

826. Linear Control Systems
Fall. 3(3-0)
P: MTH 314.
Vector spaces, representation, system description, solution to the state equations, stability, controllability and observability. Adjoints of linear maps. Eigenstructure assignment. Partial and full order observers. Disturbance decoupling.
QA: EE 826, EE 829

827. Nonlinear Systems Analysis
Spring. 3(3-0)
P: EE 826.
Existence, uniqueness and continuity of solutions. Phase portraits. Limit cycles. Linearization. Stability of equilibria and periodic orbits. Lyapunov stability. Describing functions. Perturbation. Averaging. Singular perturbation. Control applications.
QP: EE 826, MTH 424 QA: EE 827

829. Optimal Multivariable Control
Spring. 3(3-0)
P: EE 826.
Performance and robustness. Minimum time, minimum energy and regulator. Optimal control and minimum principle. LQG, Nyquist, and H-infinity design methods.
QP: EE 413, EE 826, STT 441 QA: EE 829, EE 961

831. Analog Circuit Theory
Fall of even-numbered years. 3(3-0)
Positive real functions. Filter approximations. Passive and active network synthesis. Nullor network analysis and synthesis. Active filters. Stability. Sensitivity.
QA: EE 831

832. Analog Integrated Circuit Design
Fall of odd-numbered years. 3(3-0)
Technology. Device modeling. Circuit simulation. Integrated circuit building blocks. Amplifiers, comparators, converters. Switched-capacitor filters. Analog signal processing circuits.
QP: EE 475 QA: EE 832, EE 475

835. Advanced Electromagnetic Fields and Waves I
Fall. 3(3-0)
Electrostatics, magnetostatics, electrodynamics and Maxwell's equations. Potential functions. Eigenfunction expansion. Green's functions. Radiation of EM waves. EM boundary-value problems. TEM waves. Maxwell's equations with magnetic sources.
QA: EE 835

836. Advanced Electromagnetic Fields and Waves II
Spring. 3(3-0)
P: EE 835.
Theory of guided transmission system. Microstrip lines, metallic and dielectric waveguides. EM cavities. Excitation and discontinuities of waveguides. Surface wave and radiation modes. Integrated optics. Scattering of EM waves.
QP: EE 835 QA: EE 836

841. Fourier Optics
Spring of even-numbered years. 3(2-3)
P: EE 360; EE 435 or EE 835.
Scalar diffraction theory. Fourier expansion of optical fields. Spatial linear systems and information processing. Lenses. Optical imaging systems. Holography. Measurements of optical systems.
QP: EE 355, EE 880, EE 307, EE 835 QA: EE 841

842. Quantum Electronics
Fall of even-numbered years. 3(3-0)
P: EE 835, EE 874.
Quantum and electromagnetic theory of lasers. Optical resonators. Laser oscillation and amplification. Characterization of lasers. Specific laser examples.

847. Analog and Digital Communications
Fall of odd-numbered years. 3(3-0)
P: EE 457, EE 863.
Optimum signal design in noisy channels, matched filters, quadrature sampling of band-pass signals in noise. Coherent and non-coherent binary modulation such as PSK, FSK, DPSK. M-ary modulation, inter-symbol interference, spread spectrum.
QP: EE 457, EE 863 QA: EE 847, EE 848

850. Electrodynamics of Plasmas
Spring of even-numbered years. 3(3-0)
Interdepartmental with Physics, and Astronomy and Astrophysics.
P: EE 835 or PHY 488.
Plasma kinetic and macroscopic plasma transport theory. Electromagnetic wave propagation and charged particle diffusion processes in plasma. Electromagnetic energy absorption via elastic and inelastic collisions. Dc, rf, and microwave discharges.
QP: EE 835, PHY 448 QA: EE 850

863. Analysis of Stochastic Systems
Fall. 3(3-0)
P: STT 441.
Advanced topics in random variable theory. Stochastic processes and stochastic calculus. Optimal systems for filtering and detection.
QP: EE 456 QA: EE 863

866. Digital Signal Processing
*Spring. 3(3-0) Interdepartmental with
Computer Science.*
P: EE 466, EE 863.
Review of elementary DSP concepts. Transform algorithms. Filter design and implementation. Adaptive filters. Spectrum estimation. Applications.
QP: EE 466, EE 456

874. Physical Electronics
Fall. 3(3-0)
Applications of quantum mechanics and statistical mechanics in solids. Band theory of semiconductors. Electrical transport phenomena. Pn junctions.
QA: EE 874, EE 875

875. Electronic Devices
Spring. 3(3-0)
P: EE 874.
Operating properties of semiconductor devices including DC, AC, transient and noise models of FET, BJT, metal-semiconductor contact, heterostructure, microwave and photonic devices.
QP: EE 474 QA: EE 875, EE 876

885. Artificial Neural Networks
Fall. 3(3-0) Interdepartmental with Computer Science.
Overview of neuro-engineering technology. Basic neural network architectures. Feedforward and feedback networks. Temporal modeling. Supervised and unsupervised learning. Implementation. Basic applications to pattern recognition.

899. Master's Thesis Research
*Fall, Spring, Summer. 1 to 8 credits. A
student may earn a maximum of 24 credits in all
enrollments for this course.*

QA: EE 899

**921. Advanced Topics in Digital Circuits
and Systems (MTC)**
*Fall, Spring. 3(3-0) A student may earn a
maximum of 6 credits in all enrollments for this
course. Interdepartmental with Computer Science.*
Topics vary each semester. Topics such as testable and fault-tolerant digital systems, embedded architectures.
QP: EE 809, EE 813

925. Advanced Topics in Power (MTC)
Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
Topics vary each semester. Topics such as advanced stability and control of power systems, power system planning, or advanced machine drives.
QP: EE 823, EE 824 QA: EE 920

**929. Advanced Topics in Electromagnetics
(MTC)**
*Fall, Spring. 3 to 4 credits. A student may
earn a maximum of 10 credits in all enrollments
for this course.*
Topics vary each semester. Topics such as planar waveguides and circuits, antenna theory, geometrical theory of diffraction.
QP: EE 837 QA: EE 929

**931. Advanced Topics in Electronic
Devices and Materials (MTC)**
*Fall, Spring. 1 to 4 credits. A student may
earn a maximum of 12 credits in all enrollments
for this course.*
Topics vary each semester. Topics such as VLSI technology, microdevices and microstructures, properties of semiconductors.
QP: EE 874 QA: EE 932

**932. Advanced Topics in Analog Circuits
(MTC)**
*Spring of even-numbered years. 3(3-0) A
student may earn a maximum of 3 credits in all
enrollments for this course.*
Topics vary each semester. Topics such as advanced circuit analysis.

960. Advanced Topics in Control (MTC)
Fall. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.
Topics vary each semester. Topics such as adaptive control, or nonlinear control.
QP: EE 826

963. Advanced Topics in Systems (MTC)
*Fall, Spring. 3(3-0) A student may earn a
maximum of 9 credits in all enrollments for this
course.*
Topics vary each semester. Topics such as system identification and adaptive filtering, robot dynamics and control, or learning in artificial neural networks.

**966. Advanced Topics in Signal Processing
(MTC)**
*Fall, Spring. 3(3-0) A student may earn a
maximum of 9 credits in all enrollments for this
course.*
Topics vary each semester. Topics such as discrete time processing of speech signals, multidimensional signal processing, or detection and estimation theory.

989. Advanced Topics in Plasma (MTC)
*Fall of odd-numbered years. 3(3-0) A
student may earn a maximum of 6 credits in all
enrollments for this course.*
Topics vary each semester. Topics such as plasma processing for IC fabrication, plasma diagnostic techniques.
QP: EE 850 QA: EE 989

999. Doctoral Dissertation Research
*Fall, Spring, Summer. 1 to 24 credits. A
student may earn a maximum of 72 credits in all
enrollments for this course.*

QA: EE 999

ENGINEERING EGR

College of Engineering

**150. Engineers and the Engineering
Profession**
Spring. 2(2-0)
R: Open only to freshmen and sophomores.
Overview of the engineering profession. Historical background. Engineering specialities. Engineers at work. Professionalislm and ethics. Communication skills. Future trends and challenges.

**160. Minority Engineering Education
Seminar**
Fall. 2(2-0)
R: Open only to freshmen in the College of Engineering and to freshmen no-preference students.
Issues relevant to underrepresented engineering minority groups. Diversity in engineering. Transitional problems. Communication skills. Career options.
QA: EGR 290

200. Technology, Society and Public Policy
Fall. 2(2-0)
P: 2 courses in mathematics or engineering or science.
R: Not open to freshmen.
Description and analysis of certain technologies and their consequences. Development of techniques for assessing consequences as an aid to formulation of public policy.
QA: EGR 200

290. Independent Study
*Fall, Spring, Summer. 1 to 4 credits. A
student may earn a maximum of 4 credits in all
enrollments for this course.*
R: Students in College of Engineering, approval of department.
Independent undergraduate research in engineering.

291. Selected Topics
*Fall, Spring, Summer. 1 to 4 credits. A
student may earn a maximum of 4 credits in all
enrollments for this course.*
R: Open only to freshmen, sophomores.
Experimental course development or special topics appropriate for freshmen and sophomores.
QP: EGR 290

393. Engineering Cooperative Education
*Fall, Spring, Summer. 1(1-0) A student
may earn a maximum of 6 credits in all enrollments for this course.*
R: Open only to students in College of Engineering. Educational employment assignment approved by College of Engineering.
Pre-professional educational employment experiences in industry and government related to student's major.
QA: EGR 344

ENGLISH ENG

Department of English
College of Arts and Letters

**090A. Intensive English for Non-Native
Speakers**
*Fall, Spring. 0 credit. [12(20-0) See page
A-2, item 3.]*
R: Approval of English Language Center.
Explanation and intensive practice of English skills. Focus on beginning grammar, speaking, listening, reading, and writing.
QA: ENG 091, ENG 092, ENG 093, ENG 094, ENG 095

**090B. Intensive English for Non-Native
Speakers**
*Fall, Spring. 0 credit. [12(20-0) See page
A-2, item 3.]*
R: Approval of English Language Center.
Explanation and intensive practice of English skills. Focus on intermediate grammar, speaking, listening, reading, and writing.
QA: ENG 091, ENG 092, ENG 093, ENG 094, ENG 095

**090C. Intensive English for Non-Native
Speakers**
*Fall, Spring. 0 credit. [12(20-0) See page
A-2, item 3.]*
R: Approval of English Language Center.
Explanation and intensive practice of English skills. Focus on advanced grammar, speaking, listening, reading, and writing.
QA: ENG 091, ENG 092, ENG 093, ENG 094, ENG 095

**091. English Structure for Non-Native
Speakers**
Fall, Spring. 0 credit. [3(3-0) See page A-2, item 3.]
R: Approval of English Language Center.
Explanation and practice of advanced grammatical structures of English in relation to written communication. Emphasis on editing skills.
QA: ENG 091

**092. Academic oral Skills for Non-Native
Speakers of English**
Fall, Spring. 0 credit. [3(3-0) See page A-2, item 3.]
R: Approval of English Language Center.
Intensive speaking and listening practice of spoken academic English. Lecture-listening and note-taking strategies. oral communication skills improved through discussions and classroom presentations.
QA: ENG 092

**093. Academic Reading and Writing Skills
for Non-Native Speakers of English**
Fall, Spring. 0 credit. [6(6-0) See page A-2, item 3.]
R: Approval of English Language Center.
Integrative reading and writing strategies for academic purposes. Vocabulary development, intensive and extensive reading, and critical reading skills. Academic writing style and editing strategies.
QA: ENG 094, ENG 095

**094. Academic Reading Skills for
Non-Native Speakers of English**
Fall, Spring. 0 credit. [3(3-0) See page A-2, item 3.]
R: Approval of English Language Center.
Intensive and extensive reading skills. Vocabulary development, pre-reading strategies, reading for comprehension, and critical reading skills.
QA: ENG 094