EEO 301 Signals and Systems
Provides an introduction to continuous-time and discrete-time signals and linear systems. Topics covered include time-domain descriptions (differential and difference equations, convolution) and frequency-domain descriptions (Fourier series and transforms, transfer function, frequency response, Z transforms, and Laplace transforms). Prerequisite: Differential Equations and Circuits 4 credits

EEO 306 Random Signals and Systems
Random experiments and events; random variables, probability distribution and density functions, continuous and discrete random processes; Binomial, Bernoulli, Poisson, and Gaussian processes; system reliability; Markov chains; elements of queuing theory; detection of signals in noise; estimation of signal parameters; properties and application of auto-correlation and cross-correlation functions; power spectral density; response of linear systems to random inputs. Prerequisite: ESE 305 3 credits

EEO 311 Electronics Circuits II
Differential and multistage amplifiers with bipolar junction transistors (BJT) and field-effect transistors (FET). Biasing in integrated circuits and active loads. Frequency response of common-emitter (common-source), common-base (common-gate), common-collector (common-drain) single BJT (FET) stages. Frequency response of differential-pair, cascode, and multistage circuits. Selection of coupling and by-pass capacitors. Analog integrated circuits. Metal-Oxide-Semiconductor (MOS) digital circuits with emphasis on CMOS, LEC/LAB. Prerequisite: Electronics Circuits I 3 credits

EEO 315 Electronics Circuits I
Introduction to electronics, concentrating on the fundamental devices (diode, transistor, operational amplifier, logic gate) and their basic applications; modeling techniques; elementary circuit design based on devices. Prerequisite: Circuits and Digital Logic 3 credits

EEO 323 Electromagnetics
Fundamentals of electromagnetic fields, Maxwell's Equations, plane waves, reflections. Application to transmission lines, propagation, electromagnetic sensors and transducers. Prerequisites: Courses in circuits, signals, and vector calculus. Prerequisite: Calculus III, Physics I and II, Circuits 3 credits

EEO 331 Introduction to Semiconductor Devices
The principles of semiconductor devices. Energy bands, transport properties and generation recombination phenomena in bulk semiconductors are covered first, followed by junctions between semiconductors and metal-semiconductor. The principles of operation of diodes, transistors, light detectors, and light emitting devices based on an understanding of the character of physical phenomena in semiconductors. Provides background for subsequent courses in electronics. Prerequisites: AMS 361 or MAT 303; PHY 127 or 132/134 or 142 3 credits

EEO 340 Nanotechnology, Engineering and Science
The course is targeted at undergraduate students on their early stage of education. Through the examples, exercises, and educational Java applets the course will cover electromagnetic waves and quantum mechanics including the quantum-mechanical origin of the electrical and optical properties of materials and nanostructures, chemically-directed assembly of nanostructures, biomolecules, traditional and nontraditional methods of nanolithography, interactions between electronic and optical properties, as well as the forefront topics such as organic heterostructures, nanotubes, and quantum computing. Prerequisite: Physics I, II, Calculus III 3 credits

EEO 352 Electronics Laboratory I
Electronics Laboratory I provides students with a hardware-based learning environment for hands-on experimentation with computer-based instrumentation and the construction, diagnosis, characterization of a variety of analog and digital electronic circuits. Devices used include resistors, capacitors, diodes, SCR, MOSFET, BJT, opamp, and digital ICs. Students also practice how to communicate effectively through writing reports. Prerequisite: Circuits 3 credits

EEO 353 Electronics Laboratory II
Electronics Laboratory II provides students with an advanced hardware-based learning environment for hands-on experimentation with computer-based instrumentation and the construction, diagnosis, characterization of a variety of analog and digital electronic circuits. Devices used include resistors, capacitors, diodes, SCR, MOSFET, BJT, opamp, and digital ICs. Students also practice how to communicate effectively through writing reports. Prerequisite: Circuits, Electronics Lab I 3 credits

EEO 354 Fiber Optic Communications
Design of single and multi-wavelength fiber optic communications systems. Topics include analysis of optical fibers, optical transmitters and receiver design, optical link design, single-wavelength fiber optic network with analysis of FDDI and SONET/SDH, and wavelength division multiplexing. Prerequisite: ESE 372 3 credits

EEO 366 Design using Programmable Mixed-Signal Systems-on-Chip
This course focuses on development of mixed-signal embedded applications that utilize systems on chip (SoC) technology. The course discusses design issues such as: implementation of functionality; realizing new interfacing capabilities; and improving performance through programming the embedded microcontroller and customizing the reconfigurable analog and digital hardware of SoC. Prerequisites: ESE 380 and ESE 372; ESE 224 or CSE 250 3 credits

EEO 401 RF Microwave Circuits
This course introduces the concepts of impedance matching in radio frequency (RF) circuits, S-parameter and Smith-Chart. Also, it deals with the theory and principle of various RF components such as transmission lines, waveguides, couplers, and resonators. Students learn how to design and analyze those components using analytical formulas and numerical simulation tools. Prerequisite: Circuits 3 credits

EEO 415 Intro to Microelectromechanical Systems
This course is designed as an elective for senior students. Silicon-based integrated MEMS promise reliable performance, miniaturization and low-cost production of sensors and actuators. However, MEMS have a broad applications in data storage, biomedical systems, iner-tial navigation, micromanipulation, optical display and microfluid jet systems. The course covers such subjects as materials properties, fabrication techniques, basic structure mechanics, sensing and actuation principles, circuit and system issues, packaging, calibration and testing.

EEO 425 Electronics Devices
This class is a survey of energy conversion and electrical machine systems, with the foundation being in machines and related topics. Topics include but are not limited to magnetic circuits, per unit analysis, and ac and dc machines, including both motors and generators. The course culminates in a paper design project which accounts for 50% of the course grade. Prerequisite: Electromagnetism 3 credits

EEO 482 Power Systems Engineering I
This course is a survey of modern energy systems, with the foundation being classical electrical power and related power electronics. Topics include complex power, per unit analysis, transmission line parameters and modeling, and compensation. Students also study alternative energy systems. The course also includes use of a Power Simulation Program in which modeling can be done. The simulation program is used for the final system design project paper which accounts for 50% of the course grade. Prerequisite: Circuits II or Electromagnetism 3 credits