EGE322. Electronics I Laboratory . 1 Credit.
Laboratory exercises covering op-amps, characterization of diodes, BJT, and MOSFET, diode circuits, biasing and amplification of BJT and MOSFET, including simple current source.

EGE323. Electronics II Laboratory . 1 Credit.
Laboratory exercises covering the multistage amplifier, direct coupled amplifier, difference amplifier, op-amp applications, frequency response, oscillator, waveform generator, power amplifier, and frequency response.

EGE331. Computer Simulation. 3 Credits.

EGE340. Applied Electromagnetics. 3 Credits.
Signal analysis, signal transmission. Digital communication systems. Amplitude modulation; angle modulation.

EGE341. Communication Systems Laboratory. 1 Credit.
AM communication circuits. FM communication. SSB communication circuits. RF power transmitting. Phase-locked loop circuits, frequency synthesis, time division multiplexing (sampling, PCM, DM), frequency division multiplexing, amplitude shift keying, phase shift keying, frequency shift keying.
EGE416. Control Systems. 3 Credits.
Feedback and robustness; transfer function, block diagram and signal-flow graph; Mason's gain formula; stability; Routh-Hurwitz array; steady-state error; state-space: relation to transfer function, state-diagram; design of PID controllers; design of state-feedback controllers.

EGE417. Digital Control Systems. 3 Credits.
Analysis and design of control systems that use digital controllers. Representation of digital systems with difference equations and the Z-transform; Representation of Hybrid control systems (digital controller-analog plant); Stability analysis; Design of digital controller algorithms; Verification of digital controller design via MATLAB simulation.

EGE418. Control Systems Laboratory. 1 Credit.
Simulation and hardware experiments on the following topics: plant parameter identification, robustness, steady-state error, transient duration, absolute and relative stability. Verification via simulation of controller design in the same time domain and in the frequency domain.

EGE421. Microelectronic Technology. 3 Credits.
Miller indices, Crystal growth, Major steps in the fabrication of microelectronic devices (diffusion ion implantation, thermal oxidation, film deposition (physical and chemical), etching, lithography, contacts and interconnections and yield.

EGE422. Electronic Design Automation Lab. 1 Credit.
Principles of electronic design, schematic design, electronic packaging technologies, PCB materials, PCB Layout, PCB Assembly, PCB manufacturing processes, principles of 3D modeling, 3D modeling of electronic components and enclosures.

EGE423. Solid State Devices. 3 Credits.
This course introduces the basics of semiconductor physics and modeling and devices such as pn junction diode, bipolar transistor, metal-semiconductor contacts, field effect transistor (MESFET and MOSFET), optical (solar cell LED, laser diode), power and microwave devices.

EGE424. Microelectronic Technology Lab. 1 Credit.
This course introduces students to various processing involved in fabrication of integrated circuits such as thermal oxidation, film deposition, lithography, cleaning and etching, rapid thermal processing and characterization.

EGE435. VLSI Design . 3 Credits.
Introduction to MOS devices and circuits (N-MOS, CMOS), MOS transistor theory. Integrated system processing technology and design rules (N-MOS and CMOS), circuit characterization and performance estimation, N-MOS and CMOS circuits and logic design. Interfacing. Introduction to VLSI design tools. Testability analysis. Microarchitecture of VLSI systems. Chip design projects? .

EGE445. Antenna Systems . 3 Credits.
Antenna parameters, wire antennas, arrays of wire antennas, aperture and printed circuit type antennas, reflectors and feeds.

EGE446. Antenna Systems Laboratory. 1 Credit.
Measurement of the far field pattern and characteristics of wire antennas and arrays for VHF. Measurement of the field pattern and characteristics of reflector type antennas in the X-band, and of aperture and printed circuit type antennas and arrays in the X-band.

EGE451. Electromechanical Energy Conversion . 3 Credits.
Advanced topics in electromechanical energy conversion and drives. Transformers. Induction machines, three phase and single phase, Synchronous machines, Electric drives, Induction generators.

EGE452. Electric Power Systems . 3 Credits.
Energy courses, transmission line parameters, transmission line modeling, power flow analysis, voltage frequency control, power system protection.

EGE455. Electromechanical Energy Conversion Laboratory. 1 Credit.

EGE493. Engineering Selected Topics. 12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

EGE494. Fieldwork Engineering. 1-12 Credits.
Complete a prearranged and supervised industry-based project and submit a final technical report.

EGE495. Indep Study Elec Engineering. 1-12 Credits.
Selected research areas specific to faculty.