Electrical Engineering (EE)

Courses

EE 1101 Electrical Engineering and Society: 1 semester hour.
Survey and history of the electrical engineering profession. F

EE 1199 Experimental Course: 1-6 semester hours.
This is an experimental course. The course title and number of credits are announced in the class schedule by the scheduling department. Experimental courses may be offered no more than three times with the same title and content.

EE 2240 Introduction to Electrical Circuits: 3 semester hours.

EE 2274 Introduction to Digital Systems: 3 semester hours.
Number systems; Boolean algebra fundamentals; system reduction, combinational and sequential logic. PREREQ: EE 1101. PRE-or-COREQ: EE 2274L. F

EE 2274L Introduction to Digital Systems Laboratory: 1 semester hour.
Laboratory experience in the construction of basic digital logic circuits and state machines. PRE-or-COREQ: EE 2274. F

EE 3325 Electromagnetics: 3 semester hours.
Vectors and fields, electrostatics, magnetostatics, electrodynamics, Maxwell’s equations, boundary value problems, plane and guided waves. PREREQ: EE 3340, MATH 2275, and PHYS 2212; MATH 3360 recommended. F

EE 3329 Introduction to Electronics: 3 semester hours.
Introduction to semiconductor theory, diodes, bipolar junction transistors and amplifiers, metal-oxide-semiconductor field effect transistors and amplifiers, and frequency response. PREREQ: CHEM 1111. PRE-or-COREQ: EE 3340. S

EE 3340 Fundamentals of Electrical Devices: 3 semester hours.

EE 3340L Fundamentals of Electrical Devices Laboratory: 1 semester hour.
Laboratory course emphasizing basic electrical measurements and methods. PRE-or-COREQ: EE 3340. S

EE 3345 Signals and Systems: 3 semester hours.
Linear time-invariant systems, continuous and discrete; Fourier series, Fourier transforms; discrete Fourier transforms; Laplace transforms, z-transforms; state-space analysis. PREREQ: EE 3340. PREREQ or COREQ: MATH 3360. F

EE 4400 Senior Seminar: 1 semester hour.
Current topics in Electrical Engineering. Initial selection of Senior Design projects. PREREQ: Permission of instructor. F

EE 4413 Techniques of Computer-Aided Circuit Analysis and Design: 3 semester hours.
Automatic formulation of equations and fundamental programming techniques pertinent to computer-aided circuit analysis, design, modeling. May include sensitivity calculations, system analogies, optimization. PREREQ: CS 1181, EE 3340, and EE 3342. D

EE 4416 Applied Engineering Methods: 3 semester hours.
Applied discrete and continuous probability, random variables, probability distributions, sampling, data description, parameter estimation, hypothesis testing, inference, correlation and linear and multiple regression. PREREQ: MATH 1175. S

EE 4418 Communication Systems: 3 semester hours.
Basic principles of analysis and design of modern analog and digital communication systems, including transmission and reception. PREREQ: EE 3329 and EE 3345. S

EE 4426 Computer Architecture and Organization: 3 semester hours.
Design, implementation, and performance evaluation of modern computer systems; instruction sets; datapath and control optimizations; single-cycle, multiple-cycle, and pipelined processors; hazard detection and resolution; memory hierarchies; peripheral devices. PREREQ: EE 2274 and EE 2274L. F

EE 4427 Embedded Systems Engineering: 2 semester hours.
Integration of algorithms, software and hardware to design real-time and embedded systems for signal processing and control. PREREQ: EE 4426 or CS 2275. PRE-or-COREQ: EE 4427L. S

EE 4427L Embedded Systems Engineering Laboratory: 1 semester hour.
Design and implement embedded signal processing and control systems through the integration of algorithms, software, and hardware. PREREQ: EE 4426 or CS 2275. PRE-or-COREQ: EE 4427. S

EE 4429 Advanced Electronics: 3 semester hours.
Introduction to operational amplifiers and their applications, current mirrors, active loads, differential amplifiers, feedback and stability, filters, oscillators, Schmitt triggers, power amplifiers and voltage regulators. PREREQ: EE 3329. PRE-or-COREQ: EE 4429L. F

EE 4429L Advanced Electronics Laboratory: 1 semester hour.
Transistor biasing, amplifiers and other basic analog circuit designs. PREREQ or COREQ: EE 4429. F

EE 4432 Introduction to VLSI Design: 3 semester hours.
Photolithography, CMOS Fabrication, MOSFET Operation, CMOS passive elements, design rules and layout, CAD tools for IC design, inverters, static logic and transmission gates, dynamic logic. PREREQ: EE 3329. D

EE 4433 Mixed Signal Design: 3 semester hours.
Analog IC design, Passive components, parasitic elements, component matching, IC layout techniques, amplifiers, current sources, comparators, op amps, noise, switched capacitor circuits. Includes lab work using design tools. PREREQ: EE 4432. D

EE 4472 Electrical Machines and Power: 3 semester hours.
Theory and application of electrical machinery and transformers. Power and energy relationships in power systems. PREREQ: EE 3340 and EE 3340L. PRE-or-COREQ: EE 4472L. F

EE 4472L Electrical Machines and Power Laboratory: 1 semester hour.
Experimental study of the fundamental physical phenomena and characteristics of transformers, induction motors, synchronous and direct current machines. PREREQ or COREQ: EE 4472. F

EE 4473 Automatic Control Systems: 3 semester hours.
Continuous-time control systems using both frequency-domain and state-space techniques. Topics include design methodology, performance specifications, analysis and design techniques. PREREQ: EE 3345 or ME 4405. S

EE 4474 Advanced Circuit Theory: 3 semester hours.
Methods of analog electrical circuit analysis and synthesis. Topics include signal flow graphs, multi-port networks, simulation techniques, and topological methods for formulation of network equations. PREREQ: EE 3340. D
**EE 4475 Digital Signal Processing: 3 semester hours.**
Discrete, fast Fourier and Z-transforms, correlation, convolution, finite and infinite impulse response digital filter design, spectral analysis and adaptive digital filters. Includes projects. PREREQ: EE 3345. S

**EE 4476 Semiconductor Processing and Fabrication: 3 semester hours.**
Silicon semiconductor processing and basic integrated circuit fabrication. Physics, chemistry and technology in basic processing steps in production of integrated circuits. PREREQ: PHYS 2212 or equivalent. D

**EE 4477 Semiconductor Devices: 3 semester hours.**
Operating principles of basic building blocks of modern silicon-based semiconductor devices to include p-n junctions, field effect transistors and bipolar junction transistors. PREREQ: PHYS 2212 or equivalent. D

**EE 4479 Advanced Semiconductor Devices: 3 semester hours.**
Review of semiconductor band theory. Opto-electronics, quantum mechanics, heterojunctions, power and microwave semiconductor devices. PREREQ: EE 4478 or equivalent. D

**EE 4481 Independent Problems: 1-3 semester hours.**
Students are assigned to, or request assignment to, independent problems on the basis of interest and preparation. May be repeated for a maximum of 6 credits. Equivalent to CE/ENGR 4481. PREREQ: Permission of instructor. D

**EE 4482 Principles of Power Electronics: 3 semester hours.**
Introduction to steady state converter modeling and analysis. Principles of converter dynamics and control including controller design. PREREQ: EE 3329. PREREQ or COREQ: EE 4473. D

**EE 4491 Digital Control Systems: 3 semester hours.**
Analysis and design of digital control systems, Z-transforms, transient response, stability, root locus, frequency response, design, state-space and state feedback. PREREQ: EE 4473. D

**EE 4496 Project Design: 3 semester hours.**
Conceptual design of multidisciplinary projects. Design, analysis, and implementation of senior projects proposed and defined in EE 4400. PREREQ: EE 4400. S

**EE 4496B Project Design II: 3 semester hours.**
Continuation of design sequence dealing with the design, analysis, implementation, and consequences of multi-disciplinary projects. PREREQ: EE 4496A. S

**EE 4499 Experimental Course: 1-6 semester hours.**
The content of this course is not described in the catalog. Title and number of credits are announced in the Class Schedule. Experimental courses may be offered no more than three times with the same title and content. May be repeated.