CS 388. Model-Integrated Computing. Model-Integrated Computing addresses the problems of designing, creating, and evolving information systems by providing rich, domain-specific modeling environments including model analysis and model-based program synthesis tools. Students are required to give a class presentation and prepare a project. FALL. [3]

CS 389. Master of Engineering Project.

CS 390. Individual Studies. Offered each term. [1–3]

CS 391–392. Seminar. [1–3 each semester]

CS 395–396. Special Topics. [3–3]

CS 399. Ph.D. Dissertation Research.

Electrical Engineering

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THE electrical engineer has been primarily responsible for the information technology revolution that society is experiencing. The development of large-scale integrated circuits has led to the development of computers and networks of ever-increasing capabilities. Computers greatly influence the methods used by engineers for designing and problem solving.

The curricula of the electrical engineering and computer engineering majors are multifaceted. They provide a broad foundation in mathematics, physics, and computer science and a traditional background in circuit analysis and electronics. Several exciting areas of concentration are available, including microelectronics, computer systems, robotics and control systems, and signal processing. Double majors may be arranged with some programs, including biomedical engineering and mathematics. Students receive an education that prepares them for diverse careers in industry and government and for postgraduate education.

Undergraduate Honors Program. With faculty approval, junior and senior students may be accepted into the Honors Program. To achieve honors status, the student must:

1. achieve and maintain a minimum GPA of 3.5.

2. choose 6 hours of EE/CmpE program elective credit from among the following list:

a. research-based independent study credit, or

b. design domain expertise (DE) courses beyond the one course required by the program, or

c. 300-level courses.

3. complete 3 hours of research-based independent study credit (with final written report) in addition to all other requirements.

The diploma designation is Honors in Electrical Engineering.

Facilities. Electrical and computer engineering supports undergraduate laboratories emphasizing the principal areas of the disciplines: analog and digital electronics, microcomputers, microprocessors, microelectronics, and instrumentation. In addition, several specialized facilities are available for graduate research: the advanced carbon nanotechnology and diamond labs, the Institute for Software Integrated Systems, the Institute for Space and Defense Electronics, the Medical Image Processing Laboratory, the Center for Intelligent Systems and Robotics Laboratories, the Embedded Computer Systems Laboratory, and biomedical, biosensing, and photonics laboratories.

The work in electrical and computer engineering is supported by a variety of computers and networks, including the high-performance computing facilities of the Advanced Computing Center for Research and Education. Vanderbilt is one of the founding partners in the Internet II initiative.

Curriculum Requirements

The B.E. degree in Electrical Engineering requires a minimum of 128 hours distributed as follows:

1. Mathematics (18 hours). Required courses: 155a, 155b, 175, 196, 216 (qualified students may substitute an honors mathematics sequence).

2. Basic Science (16 hours). Required courses: Chemistry 102a, Chemistry 104a, Physics 116a-b and 118a-b, MSE 150 (or Chemistry 102b for some double majors).

3. Engineering Fundamentals (6 hours). Required courses: ES 140, ES 210W.

4. Culminating Design Experience (7 hours). Required courses: EECE 295, EECE 296, EECE 297.

5. Electrical Engineering Core (24 hours). Required courses: CS 103 or 101; EECE 112, 116/116L, 213/213L, 214, 233, 235/235L.

6. Electrical Engineering Electives (18 hours). Defined by a structure that includes the five *Electrical Engineering Areas of Concentration* listed below. Students must complete at least two courses in each of two concentration areas. Students must complete at least one approved design domain expertise (DE) course as designated below. Other EECE electives to total 18 hours.

Electrical Engineering Areas of Concentration

Computer Engr.	Microelectronics	Signal/Image Processing	Robotics	Networking and Comm.
EECE 218	EECE 280 (DE)	EECE 252	EECE 254	EECE 252
EECE 256 (DE)	EECE 283	EECE 253 (DE)	EECE 257	EECE 261
EECE 271	EECE 284	EECE 254	EECE 258	EECE 262
EECE 272 (DE)	EECE 285 (DE)	EECE 256 (DE)	EECE 271	
EECE 276 (DE)	BME 271	EECE 263		
EECE 277 (DE)		EECE 286		
EECE 285 (DE)		CS 258		
CS 274 (DE)		BME 271		

(DE) designates a Design Domain Expertise course

7. Liberal Arts Core (18 hours). To be selected from the approved lists (see Distribution Requirements, p. 504).

8. Technical electives (18 hours).

a. (9–18 hours). At least 9 hours must be taken from this list of approved engineering technical electives.
BME (except 201, 240a-240b, 241a-241b)
ChE (except 216)
CE (except 216)
CS (except 101, 103, 150, 151, 255, 257)
EECE (hours above basic requirement of section 5 and 6 above)
ME
MSE (except 150)
ENGM 273

b. (0–9 hours). Up to 9 hours may be taken from this list of optional technical electives.
CS 255, 257
ChE 216 or CE 216 or ENGM 216
MSE 150 (if Chemistry 102b is used as a basic science)
ENGM 221, 244
Astronomy (except 102, 130, 203)
Biological Sciences
Chemistry (except 101a-b, 102a-b)
Earth and Environmental Sciences (except 100, 102)
Mathematics above 194 (except 198, 252)
Physics (except courses numbered 122 or below and 210)
Neuroscience 201, 255
Psychology 208, 209, 234, 236, 269

9. Open Elective (3 hours).

Double majors have special curricula that require more than 128 hours and a different distribution of electives. See the EECS Web page or the EECE double major adviser for these curricula.

Specimen Curriculum for Electrical Engineering

		Semester hours	
FRESHMAN YEAR †		FALL	SPRING
EECE 116 /116L†	Digital Logic	–	4
	Other Freshman Courses (see the engr. freshman-year specimen curriculum)	14	12
		14	**16**
SOPHOMORE YEAR			
Math 175	Multivariable Calculus	3	–
Math 196	Differential Equations and Linear Algebra	–	4
Physics 116b	General Physics	3	–
Physics 118b	General Physics Laboratory	1	–
CS 103 or 101 †	Programming and Problem Solving	3	–
EECE 112	Circuits I	3	–
EECE 213/213L	Circuits II	–	4
	Liberal Arts Core	3	3
	Technical Electives	–	6
		16	**17**
JUNIOR YEAR			
Math 216	Probability and Statistics for Engineering	–	3
ES 210W	Technical Communications	–	3
EECE 214	Signals and Systems	3	–
EECE 233	Electromagnetics	3	–
EECE 235/235L	Electronics I	4	–
	EE Program Electives ‡	–	9
	Liberal Arts Core	3	3
	Technical Elective	3	–
		16	**18**
SENIOR YEAR			
EECE 295	Project Management for EECE	3	–
EECE 296	EECE Design	–	3
EECE 297	Senior Engineering Design Seminar	1	–
	EE Program Electives ‡	6	3
	Liberal Arts Core	–	3
	Technical Electives	6	3
	Open elective	–	3
		16	**15**

† Electrical engineering majors are encouraged to take EECE 116 and EECE 116L in the spring of their freshman year in lieu of CS 103 or 101 (Basic Programming). Basic programming may be taken in the sophomore year. CS 103 is recommended over CS 101 for Electrical Engineering majors.

‡ As described in 'Electrical Engineering Degree Requirements' subsection 6. At least one design domain expertise (DE) course required prior to EECE 296.

EECE 112. Circuits I. Development of basic electrical circuit element models, signal representations, and methods of circuit analysis. Matrix methods and computer techniques. Demonstrations of physical components, measurement techniques, and transient phenomena. Corequisite: Physics 116b; Math 175. FALL, SPRING. [3]

EECE 116. Digital Logic. Numbering systems. Boolean algebra and combinational logic, graphical simplification, sequential logic, registers, and state machines. Corequisite: EECE116L. FALL, SPRING. [3]

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EECE 116L. Digital Logic Laboratory. Laboratory for EECE 116. One three-hour laboratory per week. Corequisite: EECE 116. FALL, SPRING. [1]

EECE 203–204. Independent Study. Readings or projects on basic topics in electrical engineering or related fields under the supervision of the staff. Consent of instructor required. No more than 6 hours may be applied toward graduation. [Variable credit: 1–3 each semester]

EECE 213. Circuits II. Steady-state and transient analysis of electrical networks with emphasis on Laplace transform methods and pole-zero concepts. Prerequisite: 112, Physics 116b. Corequisite: EECE 213L, Math 196. FALL. [3]

EECE 213L. Circuits II Laboratory. Laboratory for EECE 213. One three-hour laboratory per week. Corequisite: EECE 213. FALL, SPRING. [1]

EECE 214. Signals and Systems. Fundamental signals, systems, and linear algebra concepts necessary for the study of communications and control systems. Includes continuous-time and discrete-time signal and system concepts, Fourier analysis in both continuous and discrete-time, Z-transform, and the FFT. Prerequisite: EECE 112. FALL, SPRING. [3]

EECE 218. Microcontrollers. Microprocessor and microcontroller architecture with emphasis on control applications. Usage of assembly language and interfacing with programs written in high-level languages. Interfacing and real-time I/O with 8-bit microprocessors, control algorithms, and networking with microcontrollers. Prerequisite: EECE 116 and CS 101 or CS 103. Corequisite: EECE 218L. SPRING. [3]

EECE 218L. Microcontrollers Laboratory. Laboratory for EECE 218. A small structured project is required. One three-hour laboratory per week. Corequisite: EECE 218. SPRING. [1]

EECE 225. The Visual System. (Also listed as Psychology 236) Introduction to physiological optics, retinal anatomy, physiology, neurochemistry, color vision, brain processing, and clinical problems associated with the visual system. For students below senior standing, permission of instructor required. SPRING. [3]

EECE 233. Electromagnetics. Introduction to electromagnetic field theory. Maxwell's equations are developed from the historical approach. Electromagnetic waves are discussed with regard to various media and boundary conditions. Graduate credit except for electrical engineers. Prerequisite: Physics 116b. Corequisite: Math 196. FALL. [3]

EECE 235. Electronics I. Introduction to semiconductor devices and electronic circuits. Diodes, BJT and MOS transistors. Device models, modes of operation, biasing. Small-signal models, low-frequency analysis of single- and multi-stage analog amplifiers, simple amplifier design. Large signal models, dc analysis of digital circuits. No graduate credit for electrical engineers. Prerequisite: EECE 116. Corequisite: EECE 235L. FALL. [3]

EECE 235L. Electronics I Laboratory. Laboratory for EECE 235. One three-hour laboratory per week. Corequisite: EECE 235. FALL. [1]

EECE 252. Signal Processing and Communications. AM and FM modulation. Also, advanced topics in signal processing are treated. Prerequisite: EECE 214. SPRING. [3]

EECE 253. Image Processing. (Also listed as CS 253) The theory of signals and systems is extended to two dimensions. Coverage includes filtering, 2–D FFTs, edge detection, and image enhancement. Three lectures and one laboratory period. FALL. [4]

EECE 254. Computer Vision. Vision is presented as a computational problem. Coverage includes theories of vision, inverse optics, image representation, and solutions to ill-posed problems. Prerequisite: EECE 253. SPRING. [3]

EECE 256. Digital Signal Processing. Applications of Digital Signal Processing (DSP) chips to sampling, digital filtering, FFTs, etc. Three lectures and one laboratory period. Prerequisite: EECE 214. SPRING. [4]

EECE 257. Control Systems I. Introduction to the theory and design of feedback control systems, steady-state and transient analysis, stability considerations. Model representation. State-variable models. Prerequisite: EECE 213. FALL. [3]

EECE 258. Control Systems II. Modern control design. Discrete-time analysis. Analysis and design of digital control systems. Introduction to nonlinear systems and optimum control systems. Fuzzy control systems. Two lectures and one laboratory. Prerequisite: EECE 257. SPRING. [3]

EECE 261. Introduction to Voice/Data Networks. Overview of voice/data wide area networking (WAN) technologies, including the implementation of WAN designs. Prerequisite: Math 155 a/b, Physics 116a/b or equivalent. FALL. [3].

EECE 262. Introduction to Local Area Networks and Internetworking. Overview of Local Area Network (LAN) technology, internetworking, and selected higher layer applications. Common local area networking protocols, internetworking (bridging and routing), common routing protocols, dynamic routing algorithms, selected layer 4 applications, domain name system, and dynamic host configuration protocol. Prerequisite: EECE 261 or consent of instructor. SPRING. [3]

EECE 263. Signal Measurement and Analysis. (Also listed as BME 263) Discrete time analysis of signals with deterministic and random properties and the effect of linear systems on these properties. Brief review of relevant topics in probability and statistics and introduction to random processes. Discrete Fourier transforms, harmonic and correlation analysis, and signal modeling. Implementation of these techniques on a computer is required. Prerequisite: EECE 214, Probability and Statistics. FALL. [3]

EECE 264. Electromechanical Energy Conversion I. Theory and design of inductors, transformers, linear actuators, and simple motors. Prerequisite: EECE 213, Math 196. Corequisite: 233. FALL. [4]

EECE 265. Electromechanical Energy Conversion II. Theory and design of rotating machines. Dynamics and control of rotating machines. Prerequisite: EECE 264, EECE 257. SPRING. [4]

EECE 266. Power Electronics. Introduction to solid-state power electronics. Rectifiers, semiconductor switches, AC voltage controllers, controlled rectifiers, choppers, and inverters are studied. Three lectures and one laboratory. Prerequisite: EECE 213, EECE 235; Math 196. SPRING. [4]

EECE 267. Power System Analysis I. Analysis of large transmission and distribution networks. Analysis of power lines, load flow, short circuit studies, economic operation, and stability are introduced. Prerequisite: EECE 213. FALL. [3]

EECE 268. Power System Analysis II. Continued study of load flow, short circuit analysis, economic operation, and stability of power systems. Introduction to protection fundamentals. Prerequisite: EECE 267. SPRING. [3]

EECE 269. Electrical Energy Production. The production of electrical energy by conversion methods, little used today, which will become important as traditional sources of energy are depleted. Emphasis is on conservation, storage, efficiency, and direct energy conversion. Prerequisite: EECE 213, Math 196. No credit for both 269 and ME 265. SPRING. [3]

EECE 271. Introduction to Robotics. (Also listed as ME 271) History and application of robots. Robot configurations including mobile robots. Spatial descriptions and transformations of objects in three-dimensional space. Forward and inverse manipulator kinematics. Task and trajectory planning. Simulation and off-line programming. Prerequisite: Math 196 (or equivalent). ME 190 (or equivalent) recommended. FALL. [3]

EECE 272. Advanced Software Architectures. Tools and techniques for designing complex software systems. Programming language idioms, design patterns, and high-level architecture of systems. Overview of reactive systems, client-server architectures, distributed object systems, object database systems, and design methods. Lectures and seminars. A team-oriented approach is required. Prerequisite: CS 201 and knowledge of the C++ language. SPRING. [3]

EECE 273. Parallel Systems. An overview of the state of the field of Parallel Systems. Examination of the problems and limitations associated with developing parallel systems. Survey of current design trends and approaches for overcoming these problems. Critical evaluation of current and future parallel systems through review of current literature: distinguishing fact from fiction. Hands-on design experience through project work using available state-of-the-art parallel processors. Prerequisite: CS 101. SPRING. [3]

EECE 276. Embedded Systems. Advanced course on the design and application of embedded microcontroller-based systems. Architecture and capabilities of advanced microcontrollers. Embedded system modeling, design, and implementation using real-time and event-driven techniques. A structured project is required. Intended for seniors. Prerequisite: EECE 218. Corequisite: EECE 276L. FALL. [3]

EECE 276L. Embedded Systems Laboratory. Laboratory for EECE 276. A team-oriented structured project is required. One three-hour laboratory per week. Corequisite: EECE 276. FALL. [1]

EECE 277. FPGA Design. Design and applications of field-programmable gate arrays, CAD tools for design, placement, and routing. Practical experience is gained by implementing various designs on prototype FPGA board. A project is required. Prerequisite: EECE 116, EECE 218. SPRING. [3]

EECE 280. Electronics II. Integrated circuit analysis and design. High frequency operation of semiconductor devices. Frequency-response and feedback analysis of BJT and MOS analog amplifier circuits, multi-stage frequency-compensated amplifier design. Transient analysis of BJT and MOS digital circuit families. Digital-to-analog and analog-to-digital conversion circuits. Prerequisite: EECE 235. SPRING. [3]

EECE 283. Principles and Models of Semiconductor Devices. Physical principles of operation of the p-n junction, MOS field-effect transistor, and bipolar transistor. Fundamentals of charge transport, charge storage, and generation-recombination; application to the operation of MOSFET and BJT. Device modeling with emphasis on features and constraints of integrated circuit technologies. Prerequisite: EECE 235 or consent of instructor. SPRING. [3]

EECE 284. Integrated Circuit Technology and Fabrication. Introduction to monolithic integrated circuit technology. Understanding of basic semiconductor properties and processes that result in modern integrated circuit. Bipolar and MOSFET processes and structures. Elements of fabrication, design, layout, and applications as regards semiconductor microelectronic technologies. Prerequisite: EECE 235 or consent of instructor. SPRING. [3]

EECE 285. VLSI Design. Integrated circuit and fabrication techniques; CAD tools for design, layout, and verification; parasitic elements and their effects on circuit performance; system-level design experience is gained by completing design and layout phases of a project. Prerequisite: EECE 116, EECE 235 or consent of instructor. FALL. [3]

EECE 286. Audio Engineering. Engineering aspects of high fidelity sound reproduction, with emphasis on digital audio and loudspeakers. Analog-to-digital and digital-to-analog conversion, data storage, perceptual coding, loudspeaker design. Prerequisite: EECE 213 and EECE 235. SPRING. [3]

EECE 287. Engineering Reliability. Topics in engineering reliability with emphasis on electrical systems. Reliability concepts and models. Risk analysis. System examples. Prerequisite: senior standing. FALL. [3]

EECE 291–292. Special Topics. [Variable credit: 1–3 each semester]

EECE 295. Program and Project Management for EECE. Methods for planning programs and projects. Organization structures and information management for project teams. Communications between project teams and clients, government agencies, and others. Motivational factors and conflict resolution. Budget/schedule control. Similar to ENGM 274, but preparatory to the EECE senior design project course, EECE 296. Not for graduate credit. Credit given for only one of ENGM 274 and EECE 295. Prerequisite: senior standing. Corequisite: EECE 297. FALL. [3]

EECE 296. Electrical and Computer Engineering Design. Based on product specifications typically supplied by industrial sponsors, teams of students responsible for the formulation, execution, qualification, and documentation of a culminating engineering design. The application of knowledge acquired from earlier coursework, both within and outside the major area, along with realistic technical, managerial, and budgetary constraints using standard systems engineering methodologies and practices. Not for graduate credit. Prerequisite: EECE 295, at least one DE course, senior standing. SPRING. [3]

EECE 297. Senior Engineering Design Seminar. Elements of professional engineering practice. Professionalism, licensing, ethics and ethical issues, intellectual property, contracts, liability, risk, reliability and safety, interdisciplinary teams and team tools, codes, standards, professional organizations, careers, entrepreneurship, human factors, and industrial design. Prerequisite: senior standing. Corequisite: EECE 295. FALL. [1]

EECE 301. Introduction to Solid-State Materials. The properties of charged particles under the influence of an electric field, quantum mechanics, particle statistics, fundamental particle transport, and band theory of solids will be studied. FALL. [3]

EECE 302. Electric and Magnetic Properties of Solids. A review of electromagnetic theory of solids using advanced mathematical and computational techniques. Dielectric, magnetic, and optical properties. Fundamental interactions of electromagnetic radiation and charged particles in solids. Prerequisite: EECE 301 or equivalent. SPRING. [3]

EECE 304. Radiation Effects and Reliability of Microelectronics. The space radiation environment and effects on electronics, including basic mechanisms of radiation effects and testing issues. Total dose, single-event, high-dose-rate, and displacement damage radiation effects. Effects of defects and impurities on MOS long-term reliability. SPRING. [3]

EECE 305. Topics in Applied Magnetics. Selected topics in magnetism, magnetic properties of crystalline and non-crystalline materials; ferrite materials for electronics and microwave applications, resonance phenomena. Prerequisite: EECE 302 or consent of instructor. [3]

EECE 306. Solid-State Effects and Devices I. The semiconductor equations are examined and utilized to explain basic principles of operation of various state-of-the-art semiconductor devices including bipolar and MOSFET devices. FALL. [3]

EECE 307. Solid-State Effects and Devices II. The structure of solids, phonons, band theory, scattering phenomena, and theory of insulators. [3]

EECE 311. Systems Theory. Analysis and design of multivariable control systems using state space methods. Stability, controllability, and observability treated. Controllers designed using pole placement, optimal linear regulator, and the method of decoupling. State reconstruction via observers. SPRING. [3]

EECE 331. Robot Manipulators. (Also listed as ME 331) Dynamics and control of robot manipulators. Includes material on Jacobian matrix relating velocities and static forces, linear and angular acceleration relationships, manipulator dynamics, manipulator mechanism design, linear and nonlinear control, and force control of manipulators. Prerequisite: EECE 271 (0r equivalent). SPRING. [3]

EECE 341. Advanced Analog Electronics. Analysis and design of analog electronics circuits with emphasis on integrated circuits. Topics include operational amplifiers, wideband amplifiers, multipliers, and phaselocked loops. FALL. [3]

EECE 342. Advanced Digital Electronics. Analysis and design of digital electronic circuits with emphasis on integrated circuits. Topics include logic families, semiconductor memories, and the analog-digital interface. SPRING. [3]

EECE 343. Digital Systems Architecture. Architectural descriptions of various CPU designs, storage systems, IO systems, parallel and von Neumann processors and interconnection networks will be studied. [3]

EECE 350. Artificial Neural Networks. (Also listed as BME 350 and CS 350) Theory and practice of parallel distributed processing methods using networks of neuron-like computational devices. Neurobiological inspirations, attractor networks, correlational and error-correction learning, regularization, unsupervised learning, reinforcement learning, Bayesian and information theoretic approaches, hardware support, and engineering applications. SPRING. [3]

EECE 351. The Visual System. (Also listed as Cell and Developmental Biology 347, Neuroscience 347, and Psychology 336) Introduction to physiological optics, retinal anatomy, physiology, neurochemistry, color vision, brain processing, and clinical problems associated with the visual system. Graduate students attend one hour discussion section per week in addition to lecture and turn in a more extensive paper than undergraduates. SPRING. [3]

EECE 354. Advanced Real-Time Systems. Fundamental problems in real-time systems, with focus on modeling, analysis, and design. Topics include: scheduling theory and techniques, time synchronization, time- and event-triggered systems, distributed architectures, advanced programming languages for real-time systems. Literature reviews and projects. SPRING [3]

EECE 355. Intelligent Learning Environments. (Also listed as CS 364) Theories and concepts from computer science, artificial intelligence, cognitive science, and education that facilitate designing, building, and evaluating computer-based instructional systems. Development and substantiation of the concept, architecture, and implementation of intelligent learning environments. Multimedia and web-based technology in teaching, learning, collaboration, and assessment. Prerequisite: CS 260, CS 360, or equivalent. SPRING. [3]

EECE 356. Intelligent Systems and Robotics. Concepts of intelligent systems, AI robotics, and machine intelligence, using research books and papers. Emphasis on how AI, brain research, soft computing, and simulations are advancing robotics. Class projects. SPRING. [3]

EECE 357. Advanced Image Processing. (Also listed as CS 357) Techniques of image processing. Topics include image formation, digitization, linear shift-invariant processing, feature detection, and motion. Prerequisite: Math 175; programming experience. FALL. [3]

EECE 361. Random Processes. An introduction to the concepts of random variables, functions of random variables and random processes. Study of the spectral properties of random processes and of the response of linear systems to random inputs. Introduction to linear mean square estimation. The emphasis is on engineering applications. FALL. [3]

EECE 362. Detection and Estimation Theory. Fundamental aspects of signal detection and estimation. Formulation of maximum likelihood, maximum aposteriori, and other criteria. Multidimensional probability theory, signal and noise problems, and Kalman filter structure are studied. SPRING. [3]

EECE 365. Biomedical Pattern Recognition. (Also listed as BME 365) General problems of pattern recognition with applications to biomedical signals and images. Topics such as feature extraction, cluster analysis, discriminant analysis, statistical decision functions, and machine learning will be introduced. Prerequisite: EECE 263 or equivalent. SPRING. [3]

EECE 369. Master's Thesis Research.

EECE 389. Master of Engineering Project.

EECE 391–392. Seminar. [1–1]

EECE 393–394. Advanced Seminar for Ph.D. Candidates. [1–1]

EECE 395–396. Special Topics. Based on research and current developments in electrical engineering of special interest to staff and students. [3–3]

EECE 397–398. Independent Study. Readings and/or projects on advanced topics in electrical engineering under the supervision of the staff. Consent of instructor required. [Variable credit: 1–3 each semester]

EECE 399. Ph.D. Dissertation Research.

Engineering Management

E

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PROFESSORS EMERITI Jimmy L. Davidson, Robert W. House, Barry D. Lichter, Robert T. Nash
PROFESSORS Mark Abkowitz, Gautam Biswas, David M. Dilts, Kazuhiko Kawamura, Frank L. Parker
ADJUNCT PROFESSORS David A. Berezov, Christopher D. McKinney
ASSOCIATE PROFESSORS OF THE PRACTICE John A. Bers, Benjamin T. Jordan
ASSISTANT PROFESSOR OF THE PRACTICE Kenneth R. Pence

ENGINEERING management is an interdisciplinary program of study designed to expose engineering students to the concepts and theories of: the management of the engineering function, the critical elements of technology development and innovation, and the implementation of such ideas in manufacturing, engineering, and technology environments. Approximately two-thirds of all engineers spend a substantial portion of their professional careers as managers. In the complex, competitive world of technology-driven industry, skilled engineers who understand the essential principles of management and business have a competitive advantage.

The program in engineering management prepares students to work effectively in developing, implementing, and modifying technologies and systems. The ability to manage and administer large technical engineering and research projects and budgets will continue to challenge engineering management skills. Undergraduates interested in engineering management have two options. They may earn the B.E. degree in another engineering discipline with a minor in engineering management, or they may earn the B.S. degree in engineering science with engineering management as their area of concentration. Courses in engineering management may be approved for minor credit in several programs. Detailed information may be obtained from