

ELECTRICAL ENGINEERING MAJOR

The electrical engineering BS program is accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org>). The electrical engineering courses have a strong design component. Students learn the theory in the classroom and put it into practice in the laboratory, resulting in graduates who can practice in industry. The electrical engineering curriculum blends theoretical knowledge with hands-on experiential learning. An interdisciplinary team-based senior design project completes the technical education.

Students desiring to obtain a background in the next generation of computer technologies can pursue the Computer Engineering concentration within the Electrical Engineering program. That option produces high-demand engineers able to develop both hardware and software solutions. They learn computer design and computer science in addition to electrical engineering, signal processing, physics, mathematics, and the liberal arts.

Close interactions with industry results in employment of our graduates in all sectors of industry, government, and academe. They are active in the areas of power, electronics, robotics and automation, computer hardware and software design, and take the lead in the research and development of new systems and applications.

The Program Educational Objectives are broad statements that describe what alumni do within a few years following graduation. Within a few years of graduation the alumni of the Electrical Engineering Program are expected to:

1. Apply their in-depth understanding in areas of electrical systems to solve problems in a modern technological society as productive engineers and/or enter and succeed in a graduate program.
2. Function effectively, both individually and within multidisciplinary teams.
3. Continue as lifelong learners to develop their engineering design abilities, problem-solving skills, and aptitude for innovation.
4. Practice professional ethics with social responsibility through service in the framework of a global technical community.

Requirements

Bachelor of Science in Electrical Engineering

134 credits

Core Curriculum

Electrical engineering majors follow the Engineering Core Curriculum with the following prescribed courses:

Code	Title	Credits
Area I: Mathematics and Natural Sciences		
MA 0145	Calculus I for Chemistry, Engineering, and Physics Majors	4
MA 0146	Calculus II for Chemistry, Engineering, and Physics Majors	4

MA 0245	Calculus III for Chemistry, Engineering, and Physics Majors	4
MA 0251	Ordinary Differential Equations	3
MA 0351	Probability Theory	3
PS 0115 & 0115L	General Physics I and General Physics I Lab	4
PS 0116 & 0116L	General Physics II and General Physics II Lab	4
PS 0271	Electricity and Magnetism I	3
Select one additional science elective with lab		4
Area II: History and Social/Behavioral Sciences		
Select one 100-level history course		3
Select one 200- or 300-level history course		3
EC 0011	Introduction to Microeconomics	3
Select one additional social science elective		3
Area III: Philosophy and Religious Studies		
PH 0101	Introduction to Philosophy	3
Select one 200-level philosophy course		3
RS 0101	Exploring Religion (Shell)	3
Select one 200-level religious studies course		3
AE 0287	Engineering Ethics	3
Area IV: English and Visual and Performing Arts		
EN 0011	Texts and Contexts I: Writing as Craft and Inquiry	3
EN 0012	Texts and Contexts II: Writing About Literature	3
Select one 100-level English course ¹		3
Select one history-focused course in Visual and Performing Arts		3
EG 0130	Engineering Graphics I	3
Area V: Modern and Classical Languages		
Engineering majors are exempt from this requirement		
Free Electives		
Select two elective courses		6
Total Credits		81

¹ Writing courses (ENW) do not fulfill the core literature requirement. Selected courses offering literature in translation may also fulfill this requirement; see listings under Classical Studies (<https://catalog.fairfield.edu/undergraduate/arts-sciences/classical-studies>) as well as Modern Languages and Literatures (<https://catalog.fairfield.edu/undergraduate/arts-sciences/modern-languages-literatures>).

Science Electives

Suggested science elective options include:

Code	Title	Credits
BI 0170 & 0170L	General Biology I and General Biology I Lab	4
CH 0111 & 0111L	General Chemistry I and General Chemistry I Lab	4
PS 0285 & PS 0204L	Modern Physics and Modern Experimental Methods Lab	5

Electrical Engineering Major Requirements

For a 53-credit major in electrical engineering, students complete the following:

Code	Title	Credits
Electrical and Computer Engineering Foundation Courses		
CR 0245 & 0245L	Digital Design I and Digital Design I Lab	4
CS 0131	Fundamentals of Programming	3
EE 0213 & 0213L	Introduction to Electric Circuits and Electric Circuits Lab	4
EE 0346 & 0346L	Embedded Microcontrollers and Microcontroller Lab	4
EG 0031	Fundamentals of Engineering I	3
EG 0390	Senior Design Project I	3
EG 0391	Senior Design Project II	3
Select two Electrical and Computer Engineering Major electives ³		6
Electrical Engineering Track		
EE 0221	Frequency Domain Circuit Analysis	3
EE 0231 & 0231L	Introduction to Electronics Circuits and Devices and Electronics Circuits Lab	4
EE 0301	Signal and Systems I	3
EE 0331 & 0331L	Analog Electronics Design and Analog Electronics Lab	4
EG 0145	Mathematical Analysis	3
EG 0300	Feedback Control Systems	3
Select one Mechanical Engineering elective		3
Total Credits		53

³ Major Electives are courses that enable students to explore areas of interest and obtain hands-on exposure to additional topics. These courses are taken in consultation with a curriculum adviser. Options may include courses in the following areas: Power, Micro and Nanoelectronics, Systems Engineering, Communications Systems, Networking, Software and Programming, Advanced Electronics, and Digital Design.

Note: In addition to the undergraduate courses listed, advanced juniors and seniors may take appropriate graduate courses as electives with the permission of the department chair and the instructor.

Computer Engineering Option

Students interested in the computer engineering option should choose from the following courses for their electives within the EE program. Students are also encouraged to consider the Electrical and Computer Engineering 5-Year Dual Degree BS/MS (<https://catalog.fairfield.edu/undergraduate/engineering/electrical-computer-engineering/electrical-computer-engineering-five-year-dual-degree-bs-ms>) for further specialization in Computer Engineering:

Code	Title	Credits
Computer Engineering Core Courses		
CR 0246	Digital Electronics Design II	3
CR 0320	Computer Networks	3

CR 0346	Computer System Architecture	3
CS 0232	Data Structures	3
Additional Computer Engineering Courses		
CR 0325	Computer Graphics	3
CR 0331	Biomedical Signal Processing	3
CR 0332	Biomedical Imaging	3
CR 0333	Biomedical Visualization	3

Plan of Study

A typical, full-time, four-year plan of study appears below. Some variation may be possible. Students should always discuss their individual plan of study with their advisor prior to registering for courses.

Course	Title	Credits
First Year		
Fall		
EG 0031	Fundamentals of Engineering I	3
EN 0011	Texts and Contexts I: Writing as Craft and Inquiry	3
MA 0145	Calculus I for Chemistry, Engineering, and Physics Majors	4
PS 0115	General Physics I	3
PS 0115L	General Physics I Lab	1
PH 0101	Introduction to Philosophy ¹	3
Credits		17
Spring		
EG 0145	Mathematical Analysis	3
EN 0012	Texts and Contexts II: Writing About Literature	3
MA 0146	Calculus II for Chemistry, Engineering, and Physics Majors	4
PS 0116	General Physics II	3
PS 0116L	General Physics II Lab	1
CS 0131	Fundamentals of Programming	3
Credits		17
Second Year		
Fall		
EE 0213	Introduction to Electric Circuits	3
EE 0213L	Electric Circuits Lab	1
HI 0100	Origins of the Modern World Since 1500	3
MA 0245	Calculus III for Chemistry, Engineering, and Physics Majors	4
RS 0101	Exploring Religion (Shell) ¹	3
Lab Science elective ⁷		4
Credits		18
Spring		
CR 0245	Digital Design I	3
CR 0245L	Digital Design I Lab	1
EE 0221	Frequency Domain Circuit Analysis	3
EG 0130	Engineering Graphics I	3
MA 0251	Ordinary Differential Equations	3

Core (Religious Studies 200-level) ¹	3
Credits	16
Third Year	
Fall	
EE 0231 Introduction to Electronics Circuits and Devices	3
EE 0231L Electronics Circuits Lab	1
EE 0301 Signal and Systems I	3
EE 0346 Embedded Microcontrollers	3
EE 0346L Microcontroller Lab	1
MA 0351 Probability Theory	3
EC 0011 Introduction to Microeconomics ²	3
Credits	17
Spring	
EE 0331 Analog Electronics Design	3
EE 0331L Analog Electronics Lab	1
EG 0300 Feedback Control Systems	3
ME 0207 Materials Science (Choose one ME Elective, options include: or ME 0241 or Principles of Thermodynamics or ME 0201 or Engineering Statics)	3
Core Philosophy 200-level ¹	3
Core Social Sciences course ³	3
Credits	16
Fourth Year	
Fall	
PS 0271 Electricity and Magnetism I	3
EG 0390 Senior Design Project I	3
Core Visual/Performing Arts History ⁶	3
Major Elective ⁴	3
General Elective ⁵	3
General Elective ⁵	3
Credits	18
Spring	
AE 0287 Engineering Ethics	3
EG 0391 Senior Design Project II	3
Major Elective ⁴	3
Core English 100-level Literature Course ¹	3
Core History 200-level ¹	3
Credits	15
Total Credits	134

⁶ Visual and Performing Art History courses can be chosen from Art History, Music, Film/Television/Media, Theater, etc. that fulfill the VPA History requirement

¹ Choose any appropriate Core course

² Any Economics (EC) course may be substituted as advised

³ Core Social Science course may be filled by appropriate courses in Communication, Economics, Psychology, Politics, Sociology and Anthropology, etc.

⁴ Major electives are chosen from the department, but may be chosen with approval of advisory from among other courses offered in the School of Engineering

⁵ General Electives may be chosen from any courses offered at the university, and are frequently chosen to help fulfill requirements toward a chosen minor