

# Electrical Engineering

## Mission Statement

The mission of the School of Electrical, Computer, and Biomedical Engineering is to serve society as a center for learning and innovation in all major areas of electrical, computer, and biomedical engineering. The School accomplishes its mission by disseminating existing knowledge through teaching, creating new knowledge through research and publications, and by converting original ideas and concepts into new technologies. Through the integration of education and research, the School creates the academic environment necessary for training innovators and leaders for the future.

The fundamental goal of the undergraduate program in Electrical Engineering is to offer a high-quality education, designed to achieve the following specific educational objectives:

## Educational Objectives

Within a few years of graduation, Electrical Engineering graduates are expected to attain:

1. Increasing responsibility beyond that in their entry-level description in job functions within Electrical Engineering or related employment, and/or
2. Successful progress within graduate degree programs in Electrical Engineering or other professional degrees such as other Engineering, Business, Law or Medicine, and
3. Continued successful professional development and adaptation to evolving technologies within their chosen field.

The flexibility of the electrical engineering curriculum allows the students to choose courses among four tracks:

1. **Electronic Circuits and Devices:** electronic circuits, instrumentation, RF circuit design, and microwave circuit design.
2. **Electromagnetics and Photonics:** microwave engineering, antenna systems, optical imaging, fiber optic systems.
3. **Power Systems and Energy:** utility power systems, energy systems, electric drives, electric vehicles.
4. **Signals and Control:** signals and systems, signal processing, telecommunications, control.

Employment opportunities exist within a wide range of organizations, such as computer, semiconductor, aviation, electronics, microelectronics, broadcasting, telecommunications, defense, automotive, manufacturing, electric power companies, state and federal agencies, and laboratories. Employment opportunities cover the spectrum of engineering activities, ranging from research and development to systems analysis, automation, manufacturing, customer service, support, marketing, and sales.

The undergraduate program in Electrical Engineering is accredited by the Engineering Accreditation Commission of ABET, [www.abet.org](http://www.abet.org).

## Bachelor of Science (B.S.) in Electrical Engineering Degree Requirements

Degree Requirements	Credit Hours
University Core Curriculum Requirements	39
Foundation Skills: CMST 101, ENGL 101, ENGL 102, MATH 150, UNIV 101	13
Disciplinary Studies: Fine Arts, BIOL 202, Humanities, PHYS 205A, PHYS 205B, Social Science	23

Degree Requirements	Credit Hours
Integrative Studies (Multicultural/Diversity)	3
Requirements for Electrical Engineering Major	87
Basic Science: PHYS 205A, PHYS 205B, PHYS 255A, PHYS 255B, BIOL 202, Science Elective (with lab) <sup>1</sup>	6
Mathematics: MATH 150, MATH 250, MATH 251, MATH 305	11
ECE Required Courses: ECE 222, ECE 235, ECE 235L, ECE 296, ECE 296L, ECE 315, ECE 327, ECE 327L, ECE 336, ECE 345, ECE 345L, ECE 355, ECE 355L, ECE 375, ECE 495E, ECE 495D	39
ECE Technical Electives <sup>2</sup>	25
General Electives <sup>3</sup>	6
Total	126

<sup>1</sup> For Science Elective choose from biological, chemical, or physical science (CHEM 200 + CHEM 201, PHYS 305 + PHYS 355, PHSL 201 + PHSL 208).

<sup>2</sup> Two out of the following: ECE 356 & ECE 356L, ECE 385 & ECE 385L, ECE 478. At least 10 ECE hours not from ECE 412 - ECE 435. Other approved ECE technical electives by the School: ECE 3XX or 4XX level (except ECE 392, ECE 492 & ECE 493).

<sup>3</sup> Approved by the School: ECE 3XX or 4XX level (except ECE 493); CHEM 210; MATH 221, MATH 282, MATH 302, MATH 349, MATH 380, or 4XX level (except MATH 411, MATH 412); CS 3XX or 4XX level (except CS 300, CS 393, or CS 493); ENGR 2XX, 3XX, 4XX (except ENGR 222, ENGR 296, ENGR 335), ENGR 3XXi (if not already counted toward the student's core requirement); BME 485; IMAE 470A

## B.S. Electrical Engineering - Medical Devices Specialization Degree Requirements

Degree Requirements	Credit Hours
University Core Curriculum Requirements	39
Foundation Skills: CMST 101, ENGL 101, ENGL 102, MATH 150, UNIV 101	13
Disciplinary Studies: Fine Arts, BIOL 202, Humanities, PHYS 205A, PHYS 205B, Social Science	23
Integrative Studies (Multicultural/Diversity)	3
Requirements for Electrical Engineering with a Medical Devices Specialization	87

Degree Requirements	Credit Hours
Basic Science: PHYS 205A, PHYS 205B, PHYS 255A, PHYS 255B, BIOL 202, Science Elective (with lab) <sup>1</sup>	6
Mathematics: MATH 150, MATH 250, MATH 251, MATH 305	11
ECE Required Courses: ECE 222, ECE 235, ECE 235L, ECE 296, ECE 296L, ECE 315, ECE 327, ECE 327L, ECE 336, ECE 345, ECE 345L, ECE 355, ECE 355L, ECE 375, ECE 495E, ECE 495D	39
ECE Technical Electives <sup>2</sup>	25
General Technical Electives <sup>3</sup>	6
Total	126

<sup>1</sup> For Science Elective choose from biological or chemical science (CHEM 200 + CHEM 201, PHSL 201 + PHSL 208).

<sup>2</sup> Two of the following: ECE 356 & ECE 356L, ECE 385 & ECE 385L, ECE 478. At least 15 additional credit hours must include courses from the list: ECE 431, ECE 438, ECE 442, ECE 448, ECE 453, ECE 458, ECE 459, ECE 468, ECE 475, ECE 494. At least 10 ECE hours, not from ECE 412-435. Other approved ECE technical electives by the School: ECE 3XX or 4XX level (except ECE 392, 492 & 493).

<sup>3</sup> Approved by the School: ECE 3XX or 4XX level (except ECE 493); CHEM 210; MATH 221, 282, 302, 349, 380, or 4XX level (except MATH 411, 412); CS 3XX or 4XX level (except CS 300, 393, or 493); ENGR 2XX, 3XX, 4XX (except ENGR 222, 296, 335), ENGR3XXi (if not already counted toward the student's core requirement); BME 485; IMAE470A.

## B.S. Electrical Engineering - Power Systems and Energy Specialization Degree Requirements

Degree Requirements	Credit Hours
University Core Curriculum Requirements	39
Foundation Skills: CMST 101, ENGL 101, ENGL 102, MATH 150, UNIV 101	13
Disciplinary Studies: Fine Arts, BIOL 202, Humanities, PHYS 205A, PHYS 205B, Social Science	23
Integrative Studies (Multicultural/Diversity)	3
Requirements for Electrical Engineering with a Power Systems and Energy Specialization	87
Basic Science: PHYS 205A, PHYS 205B, PHYS 255A, PHYS 255B, BIOL 202, Science Elective (with lab) <sup>1</sup>	6

Degree Requirements	Credit Hours
Mathematics: MATH 150, MATH 250, MATH 251, MATH 305	11
ECE Required Courses: ECE 222, ECE 235, ECE 235L, ECE 296, ECE 296L, ECE 315, ECE 327, ECE 327L, ECE 336, ECE 345, ECE 345L, ECE 355, ECE 355L, ECE 375, ECE 385, ECE 385L, ECE 495E, ECE 495D	43
ECE Technical Electives <sup>2</sup>	23
General Technical Electives <sup>3</sup>	4
Total	126

<sup>1</sup> For Science Elective choose from biological, chemical, or physical science (CHEM 200 + CHEM 201, PHYS 305 + PHYS 355, PHSL 201 + PHSL 208).

<sup>2</sup> At least one of the ECE 356 & ECE 356L, ECE 478. At least 15 hours from ECE 456, ECE 481, ECE 482, ECE 483, ECE 484, ECE 486, ECE 487, ECE 488, ECE 489. At least 10 ECE hours, not from ECE 412-435.

<sup>3</sup> Approved by the School: ECE 3XX or 4XX level (except ECE 493); CHEM 210; MATH 221, MATH 282, MATH 302, MATH 349, MATH 380, or 4XX level (except MATH 411, MATH 412); CS 3XX or 4XX level (except CS 300, CS 393, or CS 493); ENGR 2XX, 3XX, 4XX (except ENGR 222, ENGR 296, ENGR 335), ENGR 3XXi (if not already counted toward the student's core requirement); BME 485; IMAE 470A

## Capstone Option for Transfer Students

The [SIU Capstone Option](#) is available to students who have earned an Associate in Engineering Sciences (AES) degree with a minimum cumulative 2.0/4.0 GPA on all accredited coursework prior to the completion of the AES, as calculated by the transfer institution's grading policies. The Capstone Option reduces the University Core Curriculum requirements from 39 to 30 hours, therefore reducing the time to degree completion. Students interested in the Capstone Option should contact the College of Engineering, Computing, Technology, and Mathematics Advisement Office to develop a personal coursework pathway to degree completion.

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