

## 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, by creating new knowledge through research and publications, and by converting original ideas and concepts into new technologies. Through 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.

### Additional Information

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, microwave circuit design. Relevant courses: ECE 423, ECE 438, ECE 440, ECE 446, ECE 447, ECE 449, ECE 479.
2. **Electromagnetics and Photonics:** microwave engineering, antenna systems, fiber optic systems. Relevant courses: ECE 441, ECE 448, ECE 472, ECE 477, ECE 479.
3. **Power Systems and Energy:** utility power systems, energy systems, electric drives. Relevant courses: ECE 481, ECE 483, ECE 484, ECE 486, ECE 487, ECE 488, ECE 489.
4. **Signals and Control:** signals and systems, signal processing, telecommunications, control. Relevant courses: ECE 456, ECE 459, ECE 466, ECE 467, ECE 468A, ECE 471, ECE 476, ECE 478.

Employment opportunities exist within a wide range of organizations, such as computer, semiconductor, aviation, electronics, microelectronics, broadcasting, telecommunications, defense, automotive, manufacturing and 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 and 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
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 356, ECE 356L, ECE 375, ECE 375L, ECE 385, ECE 385L, ECE 495E, ECE 495D	48
ECE Technical Electives <sup>2</sup>	16
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> Approved by the School. Approved ECE technical electives: ECE 3XX or 4XX level (except ECE 392, ECE 492 & ECE 493. At least 10 ECE hours not from ECE 412, ECE 422, ECE 423, ECE 424, ECE 425, ECE 426, ECE 427, ECE 428, ECE 429, ECE 430, ECE 431, ECE 432.

<sup>3</sup> Approved by the School. Approved general technical electives: 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 301, 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 or BME 597; IMAE 470A

## B.S. Electrical Engineering - Biomedical Specialization Degree Requirements

Degree Requirements	Credit Hours
University Core Curriculum Requirements	39

Degree Requirements	Credit Hours
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
<b>Requirements for Electrical Engineering with a Biomedical Specialization</b>	<b>87</b>
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 356, ECE 356L, ECE 375, ECE 375L, ECE 385, ECE 385L, ECE 495E, ECE 495D	48
ECE Technical Electives <sup>2</sup>	16
General Technical Electives <sup>3</sup>	6
<b>Total</b>	<b>126</b>

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

<sup>2</sup> Approved by the School. Approved ECE technical electives: ECE 3XX or 4XX level (except ECE 392, ECE 492, ECE 493). At least 10 hours not from ECE 412, ECE 422, ECE 423, ECE 424, ECE 425, ECE 426, ECE 427, ECE 428, ECE 429, ECE 430, ECE 431, ECE 432. At least 9 hours from ECE 438, ECE 458, ECE 460, ECE 467, ECE 468A, ECE 534, ECE 539, ECE 568, ECE 572, ECE 578.

<sup>3</sup> Approved by the School. Approved general technical electives: 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 301, 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 or BME 597; IMAE 470A

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

Degree Requirements	Credit Hours
University Core Curriculum Requirements	39

Degree Requirements	Credit Hours
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
Mathematics: MATH 150, MATH 250, MATH 251, MATH 305	11
ECE Required Courses: 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 356, ECE 356L, ECE 375, ECE 375L, ECE 385, ECE 385L, ECE 495E, ECE 495D	48
ECE Technical Electives <sup>2</sup>	18
General Technical Electives <sup>3</sup>	4
<b>Total</b>	<b>126</b>

<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 18 hours from ECE 456, ECE 481, ECE 482, ECE 483, ECE 484, ECE 486, ECE 487, ECE 488, ECE 489.

<sup>3</sup> Approved by the School. Approved general technical electives: 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 301, 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 or BME 597; IMAE 470A

Students interested in meeting the requirements of both the Electrical Engineering and the Computer Engineering degree programs may ask the advisement office for a guide suggesting how one may complete both in a timely manner.

## 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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**Catalog Year Statement:**

Students starting their collegiate training during the period of time covered by this catalog (see bottom of this page) are subject to the curricular requirements as specified herein. The requirements herein will extend for a seven calendar-year period from the date of entry for baccalaureate programs and three years for associate programs. Should the University change the course requirements contained herein subsequently, students are assured that necessary adjustments will be made so that no additional time is required of them.