

Computer Engineering

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 Computer Engineering is accredited by the Engineering Accreditation Commission of ABET, abet.org.

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.

Bachelor of Science (B.S.) in Computer Engineering

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

Educational Objectives

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

1. Increasing responsibility beyond that in their entry-level description in job functions within Computer Engineering or related employment, and/or
2. Successful progress within graduate degree programs in Computer 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.

In the computer engineering curriculum the students can choose courses in:

1. **Design Automation and Application Programming:** Algorithms and software development for digital integrated circuits, embedded systems, microcontrollers, multicore architecture, networks. Relevant courses in this track are ECE 422, ECE 424, ECE 425, ECE 426, ECE 432, and ECE 456.
2. **Computer Hardware Design:** Design and evaluation of integrated circuits, configurable hardware, embedded systems, computer architectures. Relevant courses: ECE 422, ECE 423, ECE 424, ECE 425, ECE 426, ECE 427, ECE 428, and ECE 429.

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B.S. Computer Engineering Degree Requirements

| Degree Requirements | Credit Hours |
|---|--------------|
| University Core Curriculum Requirements | 39 |
| Foundation Skills | 13 |
| CMST 101 | 3 |
| ENGL 101, ENGL 102 | 6 |
| MATH 150 (4) | 3 |
| UNIV 101 | 1 |
| Disciplinary Studies | 23 |
| Fine Arts | 3 |
| BIOL 202 | 2 |
| Humanities | 6 |
| PHYS 205A | 3 |
| PHYS 205B | 3 |
| Social Science | 6 |
| Integrative Studies (Multicultural/Diversity) | 3 |
| Requirements for Computer Engineering Major | (11)+87 |
| Basic Science | (8)+6 |
| PHYS 205A, PHYS 205B, PHYS 255A, PHYS 255B | (6)+2 |
| BIOL 202 | 2 |
| Science Elective (with lab) ¹ | 4 |
| Mathematics | (3)+11 |
| MATH 150, MATH 250, MATH 251, MATH 305 | (3)+11 |
| ECE Required Courses: ECE 222, ECE 235, ECE 235L, ECE 296, ECE 296L, ECE 315, ECE 321, ECE 321L, ECE 327, ECE 327L, ECE 329, ECE 329L, ECE 345, ECE 345L, ECE 355, ECE 355L, ECE 495C, ECE 495D | 41 |

| Degree Requirements | Credit Hours |
|--|--------------|
| Technical Electives ² | 29 |
| ECE Technical Electives ³ | 23 |
| General Technical Electives ⁴ | 6 |
| Total | 126 |

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

² At least 20 hours from the following list: ECE 412-432, two approved CS courses from CS 3XX or 4XX level (except CS 300, CS 393, or CS 493)

³ Approved by the School. Approved ECE technical electives: ECE 3XX or 4XX level (except ECE 392, ECE 492 & ECE 493)

⁴ Approved by the School. Approved General technical electives: ECE 3XX or ECE 4XX level (except ECE 493); CHEM 210; MATH 221, MATH 282, MATH 302, MATH 349, MATH 380, or MATH 4XX level (except MATH 411, MATH 412); CS 3XX or 4XX level (except CS 300, CS 393, or CS 493); ENGR 2XX, ENGR 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

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.

B.S. Computer Engineering - Cyber Systems and Security Engineering Specialization Degree Requirements

| Degree Requirements | Credit Hours |
|---|--------------|
| University Core Curriculum Requirements | 39 |
| Foundation Skills | 13 |
| CMST 101 | 3 |
| ENGL 101, ENGL 102 | 6 |
| MATH 150 (4) | 3 |
| UNIV 101 | 1 |
| Disciplinary Studies | 23 |
| Fine Arts | 3 |
| BIOL 202 | 2 |

| Degree Requirements | Credit Hours |
|---|--------------|
| Humanities | 6 |
| PHYS 205A | 3 |
| PHYS 205B | 3 |
| Social Science | 6 |
| Integrative Studies (Multicultural/Diversity) | 3 |
| Requirements for Computer Engineering Major | 87 |
| Basic Science | |
| PHYS 205A, PHYS 205B, PHYS 255A, PHYS 255B | (6)+2 |
| BIOL 202 | (2) |
| Science Elective (with lab) ¹ | 4 |
| Mathematics | |
| MATH 150, MATH 250, MATH 251, MATH 305 | (3)+11 |
| ECE Required Courses: ECE 222, ECE 235, ECE 235L, ECE 296, ECE 296L, ECE 315, ECE 321, ECE 321L, ECE 327, ECE 327L, ECE 329, ECE 329L, ECE 345, ECE 345L, ECE 355, ECE 355L, ECE 495C, ECE 495D | 41 |
| Technical Electives ² | 29 |
| ECE Technical Electives ³ | 23 |
| General Technical Electives ⁴ | 6 |
| Total | 126 |

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

² At least 20 hours from the following list: ECE 412-432, two approved CS courses from CS 3XX or 4XX level (except CS 300, CS 393, or CS 493). One of the following courses: ECE 434, CS 410. Only one of those courses will count towards specialization. At least one course from the following list: ECE 418, CS 408, CS 409, ECE 517, ECE 518. At least two courses from the following list: ECE 412, ECE 422, ECE 424, ECE 431, CS 415. At least two courses from the following list: ECE 417, ECE 419, ECE 428, ECE 430, ECE 475, CS 413, ECE 541.

³ Approved by the Department. Approved ECE technical electives: ECE 3XX or 4XX level (except ECE 392, ECE 492 & ECE 493).

⁴ Approved by the Department. 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), ENGR3XXi (if not already counted toward the student's core requirement); BME 485 ; IMAE 470A.

Capstone Option for Transfer Students

The SIU Capstone Option may be available to eligible students who have earned an associates degree or the equivalent. The Capstone Option reduces the University Core Curriculum requirements from 39 to 30 hours, therefore reducing the time to degree completion. See the Capstone Option section for more information on this option.

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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.