ELECTRONICS ENGINEERING, BACHELOR OF SCIENCE

The Electrical and Computer Engineering (ECE) department’s Electronics Engineering Program (EENG) is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Program Educational Objectives

The Program Educational Objectives (PEOs) for the electronics engineering program are a statement of what its graduates are doing or are capable of doing three to five years after graduation. The students in the electronics engineering program receive a strong foundation in engineering science and design that not only enables them to pursue productive careers in the electronics engineering field but also in other areas such as business, management, and medicine. Typical industries in which electronics engineering graduates are employed could include those in communication systems, telecommunication networks, analog systems, hardware/software integration, and digital and microprocessor systems.

The Program Educational Objectives for the electronics engineering program are that graduates will be:

- Employed in business, academia, or government.
- Successful engineers who have established productive careers in their field and have contributed to improve and provide innovative and effective solutions in electronics engineering or related fields.
- Demonstrating technical and decision-making processes and the human interactions necessary to produce viable, responsible, and sustainable technological solutions.
- Engaging in lifelong learning, which may include postgraduate education, to successfully adapt to technological, industry specific, and cultural changes and to foster adept functioning in society.
- Performing engineering practice in a context that reflects awareness of the ethics of their profession and of the impacts of their work on the profession and society at large.

These Program Educational Objectives were developed with input from the program outcomes constituency group consisting of: employers (including the Industry Advisory Board), graduates of the program, faculty of the department, and students in the program.

Student Outcomes

Student Outcomes are those abilities that a graduate of the Electronic Engineering program will have attained so that he/she can meet the educational objectives established for the program.

At the time of graduation, students in the ECE Electronic Engineering program will have:

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to design a system, component, or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- An ability to function on multidisciplinary teams.
- An ability to perform analysis and interpret data.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to identify, formulate, and solve engineering problems.
- An understanding of professional and ethical responsibility.
- An ability to communicate effectively.
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- A recognition of the need for, and an ability to, engage in lifelong learning.
- A knowledge of contemporary issues.
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

These student outcomes have been developed with input from the program outcomes constituency group consisting of: employers (including the Industry Advisory Board), graduates of the program, faculty of the department, and students in the program.

The 124 credit hour program in electronics engineering leads to the Bachelor of Science degree in Electronics Engineering. Thirty-two hours of mathematics and physics complement the required 60 hours of work in the electronics engineering area. Six hours in written and oral communications, 15 hours in Achievement Centered Education (ACE) electives, and 8 hours of technical electives provide the opportunity for the student to acquire a general educational background and gain the cultural attributes associated with a university education. The individual holding this degree will have advanced knowledge in his or her field of engineering interest and in addition will have a university educational background involving mathematics, the physical sciences, and the humanities and social sciences. Completion of this program will enable the graduate to enter employment in positions involving telecommunications engineering design, analog circuit design, telecommunications network performance analysis, and technical management of telecommunications networks. The program also leads to the preparation for graduate work in electronics engineering or electrical engineering.

Requirements

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<tr>
<td>ECEN 1030</td>
<td>COMPUTER AND ELECTRONICS ENGINEERING FUNDAMENTALS</td>
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<td>MATH 1950</td>
<td>CALCULUS I</td>
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Second Semester

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<td>SPECIAL TOPIC IN COMPUTER ELECTRONICS ENGINEERING</td>
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<td>ECEN 2250</td>
<td>COMPUTER AND ELECTRONICS ENGINEERING SEMINAR</td>
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<td>MATH 1960</td>
<td>CALCULUS II</td>
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<td>PHYS 2110</td>
<td>GENERAL PHYSICS I - CALCULUS LEVEL</td>
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<td>CMST 1110</td>
<td>PUBLIC SPEAKING FUNDS</td>
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### Second Year

#### First Semester
- **ECEN 2130**  ELECTRICAL CIRCUITS I  3
- **ECEN 2184**  ELECTRICAL CKT I LAB  1
- **MATH 2050**  APPLIED LINEAR ALGEBRA  3
- **MATH 2350**  DIFFERENTIAL EQUATIONS  3
- **PHYS 2120**  GENERAL PHYSICS-CALCULUS LEVEL  4
- **PHYS 1164**  GENERAL PHYSICS LABORATORY II  1

#### Credits
15

#### Second Semester
- **ECEN 2140**  ELECTRICAL CIRCUITS II  3
- **ECEN 2220**  ELECTRONIC CIRCUITS I  4
- **ECEN 3130**  SWITCHING CIRCUITS THEORY  4
- **MATH 1970**  CALCULUS III  4

#### Credits
15

### Third Year

#### First Semester
- **ECEN 3070**  ELECTRICAL ENGINEERING LABORATORY I  2
- **ECEN 3280**  APPLIED FIELDS AND LINES I  3
- **ECEN 3520**  ELECTRONIC CIRCUITS II  4
- **ECEN 3550**  SIGNALS AND LINEAR SYSTEMS  3
- **STAT 3800**  APPLIED ENGINEERING PROBABILITY AND STATISTICS  3

#### Credits
15

#### Second Semester
- **ECEN 3250**  COMMUNICATIONS SYSTEMS  4
- **ECEN 3620**  DATA AND TELECOMMUNICATIONS TRANSCEIVERS  4
- **ENGL 3980**  TECHNICAL WRITING ACROSS THE DISCIPLINES  3

#### ACE Elective
6

#### Credits
17

### Fourth Year

#### First Semester
- **ECEN 4960**  CAPSTONE I  2
- **ENGR 4690**  TECH, SCIENCE & CIVILIZATION  3
- **ECEN 4660**  TELECOMMUNICATION ENGINEERING I  4
- **ECEN 4610**  DIGITAL COMMUNICATIONS MEDIA  4
- **Engineering elective**  4

#### Credits
16

#### Second Semester
- **ECEN 4990**  CAPSTONE II  3

#### ACE Electives
6

#### Engineering Elective
5

#### Credits
14

**Total Credits**
124

1. ACE elective: Choose one course from each ACE Student Learning Outcome (SLO) 5, 6, 7, 8 and 9 elective course.
2. Students may substitute ENGR 1000 for CMST 1110
3. Students may substitute ENGR 3000 for ENGL 3980
4. Engineering electives may be selected from ECE junior and senior or approved sophomore level courses. Three hours of engineering electives may be selected from an approved list of non-ECE courses.