ELECTRICAL & COMPUTER ENGINEERING

The mission of the department of Electrical & Computer Engineering (ECE) at the University of Nebraska is to provide undergraduate and graduate level education in electrical and computer engineering, perform research and other scholarly activities, and furnish service to the state, nation, industry, and the profession. To fulfill this mission, the ECE department offers the degrees of Bachelor of Science in electrical, computer, and electronics engineering as well as several graduate programs. The faculty takes pride in its high level of interaction with both undergraduate and graduate students.

General Requirements

The following sections apply to the electrical, computer, and electronics engineering programs. For more details visit the ECE department’s web site at http://engineering.unl.edu/ece

Advisement

Upon entry into the curriculum, each student will be assigned an academic advisor. It is required that each student meet with the advisor prior to each class registration period and that all courses to be applied toward the degree be selected with the advice and approval of the advisor.

Curriculum

Because of the rapid developments in the fields of electrical, computer, and electronics engineering, the curricular requirements are continually reviewed and upgraded to reflect technological advances. Curricular sequence and course descriptions contained herein are intended to serve as general guidelines. Contact the ECE department for information on any changes to the requirements that are currently in effect but not listed in this catalog.

Students who do not maintain continuous progress toward a degree through enrollment in applicable course work will be considered as new students upon reentering the electrical, computer, or electronics engineering curricular sequence and will be subject to the requirements of the curriculum current at the time of their reentry. Certain courses may not be valid as prerequisites or as credit toward the degree after two academic years; the student’s academic advisor should be consulted regarding applicability. Electrical and electronic engineering majors must have a “C” or better in ECEN 2130 and ECEN 2140, and computer engineering majors must have a “C” or better in ECEN 2130 and ECEN 3130. Students must have a “C” or better in some courses to be used as a prerequisite for other courses. See the department for exceptions to this rule. The applicable University bulletins and college academic policies must be followed to ensure the student satisfies all of the Achievement Centered Education (ACE) requirements.

Design Requirement

All engineering majors require a minimum of 48 credit hours of engineering topics (engineering topics include subjects in the engineering sciences or engineering design). Engineering design is the process of devising a system, component, or process to meet desired needs. Engineering design work may be done by individuals; however, team efforts are encouraged where appropriate. Engineering majors are provided with an integrated engineering design experience throughout the curriculum. In addition, all engineering programs include a meaningful major design experience that builds upon the fundamental concepts of mathematics, basic sciences, humanities, social sciences, engineering topics, and communication skills.

Electives

Electrical Engineering

Fifteen (15) credit hours of technical electives, referred to as “Other Technical Electives,” may be taken from any 300 or 400 level course offering (with some exceptions) in the ECE Department or in any other engineering department within the College of Engineering or in the Departments of Biological Sciences, Chemistry, Computer Science and Engineering, Mathematics, Statistics, or Physics and Astronomy at UNL and the corresponding departments at UNO.

Six (6) credit hours of the 15 credit hours of technical electives may be taken as a “Research Option.” The purpose of the Research Option is to provide research experiences and offer opportunities for students to work with a faculty advisor on a specific research topic. A certificate of completion of thesis will be awarded to the students, and outstanding thesis awards will be presented at the end of semester functions.

Computer Engineering

Fifteen (15) hours of engineering electives are required for the degree. These courses can be satisfied by ECEN courses at the junior and senior or approved sophomore level courses. Three (3) hours of engineering electives may be selected from an approved list of non-ECEN courses.

Electronics Engineering

Eight (8) hours of engineering electives are required for the degree. These courses can be satisfied by ECEN courses at the junior and senior, or approved sophomore level courses. Three hours of engineering electives may be selected from an approved list of non-ECEN courses.

Special Interest Areas

Opportunities are provided for the development of areas of special interest through enrollment in the individual study courses which are offered at the freshman through senior level for the student who may wish to develop a topic under the guidance of a department faculty member. Enrollment is by permission after a written proposal has been approved. Special topics courses are also offered by the department as the need arises. Academic advisors should be consulted regarding the particular topics to be covered and the necessary prerequisites for each offering of this course. Students who expect to continue their education at the graduate level after the award of the baccalaureate degree should consult their advisors regarding course selections that would enhance that objective.

Students are encouraged to develop their professional and leadership potential through participation in student chapters of related professional organizations and in University extracurricular activities. Participation in the University Honors Program is encouraged for those who qualify.

Transfer Course Work

The applicability of transfer course work with engineering content toward credit in the curriculum is determined on a case-by-case basis by the department.

Financial Aid

Numerous opportunities exist for students to obtain financial aid during the course of their academic work at the university. The office of the dean of the college and the campus financial aid office should be consulted to determine the availability of such assistance.
**Degrees Offered**

- Electrical Engineering (http://catalog.unomaha.edu/undergraduate/college-engineering/electrical-computer-engineering/electrical-engineering-bs)
- Computer Engineering (http://catalog.unomaha.edu/undergraduate/college-engineering/electrical-computer-engineering/computer-engineering-bs)
- Electronics Engineering (http://catalog.unomaha.edu/undergraduate/college-engineering/electrical-computer-engineering/electronics-engineering-bs)

**Emphasis Areas**

The ECE department offers several emphasis areas in electrical engineering so that students can pursue an in-depth study of a topic of interest.

The requirements for an emphasis area are that a student must take at least 12 credit hours from electrical engineering courses referred to as "EE Technical Electives." At least 6 of the 12 credit hours must be taken from one emphasis area, one of which must be a course listed as core below. At least one 3 credit hour course from a different EE emphasis area must be taken. The remaining 3 credits may be satisfied by any nonrequired 300 or 400 level electrical engineering course except ELEC 399.

**The emphasis areas are:**

- **Communications and Signal Processing**
  ECEN 4100, ECEN 3250/ECEN 4620 Core,
  ECEN 4240/ECEN 4630 Core, ECEN 4610/ECEN 4640, ECEN 4650

- **Electromagnetic Fields and Optics**
  ECEN 4080 Core, ECEN 4670, ECEN 4680, ECEN 4790,
  ECEN 4800, ECEN 4860

- **Energy and Power Systems**
  ECEN 3380 Core, ECEN 4060, ECEN 4070, ECEN 4280 Core,
  ECEN 4300, ECEN 4360, ECEN 4440, ECEN 4980X

- **Electronics**
  ECEN 3520/ECEN 3610 Core, ECEN 3620, ECEN 4690,
  ECEN 4700, ECEN 3100/ECEN 4740 Core

- **Materials and Devices**
  ECEN 4170, ECEN 4200, ECEN 4210 Core, ECEN 4220

- **Bioengineering**
  ECEN 4500 Core, ECEN 4600, ECEN 4980E, ECEN 4980S

- **Modeling and Simulation**
  ECEN 3980M Core, ECEN 4480, ECEN 4980M

- **Telecommunications**
  ECEN 3620, ECEN 4610/ECEN 4640 Core, ECEN 4660 Core

Consult with an academic advisor for further information on the courses within each option area and any prerequisites that may be needed.