

# Electrical Engineering

The Electrical and Computer Engineering Department offers an accredited program leading to the **Bachelor of Science degree in Electrical Engineering (BSEE)**. The Montana State University Electrical Engineering Program is accredited by the Engineering Accreditation Commission of ABET <http://www.abet.org>.

Electrical Engineering offers the graduate extensive opportunities in such fields as telecommunications, control systems, microprocessors, instrumentation, electromagnetic systems, optical and electro-optical systems, power electronics, fuel cells, electrical power, and computer-controlled devices. In addition, electrical engineers play key roles in interdisciplinary efforts such as communications networks, remote sensing, aerospace systems, medical instrumentation, transportation systems, manufacturing, and numerous other applications of great social impact. Electrical engineers are leaders in the development of such technological innovations as the Internet, high definition television, fiber optic communications, and personal communication systems. As an electrical engineer, employment opportunities are available in numerous engineering careers, such as advanced research and development, design and applications engineering, manufacturing engineering, sales, and management.

The undergraduate program is designed to provide the student with the fundamental background in Mathematics, basic science, engineering, and personal communication to allow the graduate to be a contributing member in the engineering community. The electrical engineering curriculum provides the integrated educational experience whereby the student develops the skills to identify and to solve technical problems by applying pertinent electrical engineering knowledge to the solution of practical problems. This breadth of engineering knowledge and the ability to communicate that knowledge requires a broad-based education in various fields as well as professional elective courses. These professional electives enable the student to study in depth one or more of the following areas: logic design, digital signal processing, computer and microprocessor applications, electromagnetic theory, optics and photonics, control systems, electrical power systems, electronic circuits, and telecommunications.

Technical electives available outside the department allow students to broaden their knowledge and understanding of other engineering and scientific areas. These electives can also be used to take relevant coursework in business, finance, law, and management.

The electrical engineering program educational outcomes are:

- a. An ability to apply knowledge of mathematics, science, and engineering.
- b. An ability to design and conduct experiments, as well as to analyze and interpret data.
- c. An ability to design a system, component, or process to meet desired needs.
- d. An ability to function on multi-disciplinary teams.
- e. An ability to identify, formulate, and solve engineering problems.
- f. An understanding of professional and ethical responsibility.
- g. An ability to communicate effectively.

h. The broad education necessary to understand the impact of engineering solutions in a global and societal context.

i. A recognition of the need for, and an ability to engage in lifelong learning.

j. A knowledge of contemporary issues.

k. An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

l. Knowledge of the principles of project management and design trade-offs.

r. An ability to analyze and synthesize electronic devices and electrical systems.

## Student Performance and Retention Requirements

Students are required by Board of Regents policy to achieve a C- or better grade in each class used to satisfy the BSEE degree requirements.

## Undergraduate Programs

- B.S. in Electrical Engineering (<http://catalog.montana.edu/undergraduate/engineering/electrical-computer-engineering/electrical-engineering/bs-electrical-engineering>)
- Electrical Engineering Minor (Non-Teaching) (<http://catalog.montana.edu/undergraduate/engineering/electrical-computer-engineering/electrical-engineering/electrical-engineering-nonteaching-minor>)
- Optics Minor (Non-Teaching) (<http://catalog.montana.edu/undergraduate/engineering/electrical-computer-engineering/electrical-engineering/optics-minor-nonteaching>)

## Graduate Programs

Please refer to the ECE graduate programs section (<http://catalog.montana.edu/graduate/engineering/electrical-computer-engineering>) of the catalog.

### **Font Notice**

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Times was used instead of Adobe Garamond Pro.

The editor may contact Leepfrog for a draft with the correct fonts in place.