

# 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>. (<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.

In the senior year each electrical engineering student takes part in a capstone design project. This project allows the student to function as part of a team on a real world problem, and the student, in addition to accomplishing the design, must also communicate his or her work in both a written paper and an oral presentation. All projects are intended to bring the student's academic training to a logical conclusion and further develop the problem-solving skills and the communication skills of the electrical engineering graduate.

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:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must

consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

## 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.