

# Computer Engineering

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

In the fast-paced field of computers, the computer engineering graduate will be prepared for careers in exciting innovative technologies including embedded systems, programmable logic, hardware/software co-design, and digital signal processing. With increased processor capacity and processing speeds, re-programmable logic devices offer far-reaching opportunities for the computer engineer to create new applications unheard of today. The computer engineer uses knowledge of both electronics hardware and software to achieve state-of-the-art solutions, often involving programmable logic devices and microprocessors. The computer engineering curriculum is designed to prepare students for engineering careers where programming and software skills are blended with the understanding of hardware design.

The computer engineering program at MSU is interdisciplinary and incorporates substantial coursework from both the Electrical and Computer Engineering Department and the Computer Science Department. All students in the Electrical and Computer Engineering Department develop common skills in basic science, mathematics, basic electronics and circuits; however, the computer engineering student diverges from the electrical engineering student by taking more computer science and computer architecture courses, as well as a full complement of courses in microprocessors and programmable devices.

In the senior year each computer 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 computer engineering graduate.

The computer 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 BSCpE degree requirements.

## Undergraduate Programs

- Bachelor of Science in Computer Engineering (<http://catalog.montana.edu/undergraduate/engineering/electrical-computer-engineering/computer-engineering/bs-computer-engineering/>)
- Computer Engineering Minor (Non-Teaching) (<http://catalog.montana.edu/undergraduate/engineering/electrical-computer-engineering/computer-engineering/computer-engineering-nonteaching-minor/>)

## Graduate Programs

Students enrolled in the Electrical Engineering (M.S. and M.Eng.) graduate program or the Electrical & Computer Engineering (Ph.D.) graduate program can pursue cutting edge computer engineering research projects.

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