Computer Engineering programs\textsuperscript{1,2} teach individuals to apply mathematical and scientific principles to the design, development and operational evaluation of computer hardware and software systems and related equipment and facilities. Students will learn how to analyze various tasks in preparation for designing, developing, and implementing computer programs and information management systems in order to meet various operational and cost objectives. Students will develop a strong background in basic computer engineering subjects, physics, and mathematics, and then take specific courses related to computers, electronics, and applied physics.

Many colleges, including Montana State University, sponsor cooperative education or internship programs in which student engineers can work for a company while they are attending school. In this way, students gain valuable experience while they are receiving academic training in their field.

The Computer Engineering Program at Montana State University\textsuperscript{2} is interdisciplinary and incorporates substantial coursework from both the Electrical and Computer Engineering Department and the Computer Science Department. All engineering 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. The computer engineering curriculum is designed to prepare students for engineering careers where both programming or software skills are blended with the understanding of hardware design. 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.

Characteristics associated with success\textsuperscript{1} in this major include curiosity and ingenuity, an interest in mathematics, the physical sciences, and computer technology.

A students should\textsuperscript{1}:
\begin{itemize}
  \item display an ability for logical thinking and problem solving
  \item like working in a team environment with other engineers and scientists
  \item possess creativity and an analytical mind
  \item have good oral and written communication skills
  \item have good computer skills
\end{itemize}

Occupations in this field require ability to\textsuperscript{1} : work as part of a team and the willingness to strive to keep up with the rapid changes in technology.

Related occupations include\textsuperscript{1}:
\begin{itemize}
  \item Computer Engineer
  \item Sales Engineer
  \item Computer Service Technician
  \item Computer Network Specialist
  \item Computer Software Engineer
  \item Electrical Engineer
  \item Electrical Test Engineer
  \item Design Engineer
  \item Electronics Engineer
  \item Cable Engineer, Outside Plant
  \item Electrical Engineer, Power System
  \item Power-Distribution Engineer
  \item Power-Transmission Engineer
  \item Central-Office Equipment Engineer
  \item Systems Integration Engineer
\end{itemize}
MSU graduates (Bachelor’s degree) were hired in the following selected fields:\(^3:\)

- Assistant Engineer – Schmidt
- Computer Engineer – Naval Undersea Warfare Center
- Computer Engineer and IT Systems Specialist – S2 Corporation
- Design Verification Engineer – Micron Technology, Inc.
- Electrical Engineer – Boeing
- Embedded Systems Engineer – Montana State University
- Engineer – Honeywell
- ETL Technician – AITC
- Information Systems Engineer – AuBeta Networks
- Manufacturing Engineer – ILX Lightwave Corporation
- Module Test Engineer – Micron Technology, Inc.
- Research Associate – Montana State University
- Software Engineer – Midwest Technologies; Micron Technology, Inc.
- Staff Engineer – Williston Basin
- Systems Engineer – Advanced Acoustic Concepts
- Systems Developer – Zoot Enterprises
- Test Engineer – Micron Technology, Inc.

Salary averages of survey respondents: (# of respondents in parentheses)\(^3:\)

<table>
<thead>
<tr>
<th>Year</th>
<th>MT</th>
<th>Out of State</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>$64,000 (2)</td>
<td>Insufficient Data (0)</td>
</tr>
<tr>
<td>2011</td>
<td>$63,000 (2)</td>
<td>Insufficient Data (1)</td>
</tr>
<tr>
<td>2010</td>
<td>Insufficient Data (0)</td>
<td>$56,750 (4)</td>
</tr>
<tr>
<td>2009</td>
<td>$52,500 (2)</td>
<td>$45,400 (5)</td>
</tr>
</tbody>
</table>

In the field for “Computer Hardware Engineer” the lowest 10% of salaries for 2012 (comparable to new college graduate starting salaries) was $64,000 annually. The median\(^3\) wages in the nation in 2012 was estimated at $100,920 annually. In 2012 there were 83,300 positions nationally with an expected growth forecast of +7% through 2022\(^4\). In 2012 the lowest 10% of salaries for the state of Montana (comparable to new college graduate starting salaries) was $55,500 annually. The median\(^3\) wages in Montana in 2012 was estimated at $93,400 annually. In 2012 there were 50 positions in Montana with an expected growth forecast of +21% through 2022\(^4\). Job openings in Montana and nationally are due to both growth and net replacement.

Please remember when reviewing the salary information that it is the “median”\(^3\), meaning 50% of reported wages fell below and 50% above the reported wage.

Graduates from this program entered programs of further education at these institutions:

None available at this time

Other Sources of Information:

- Sloan Career Cornerstone: www.careercornerstone.org/compeng/compeng.htm
- Association for Computing Machinery: www.acm.org
- Association for Women in Computing: www.awc-hq.org/home.html
- IEEE Computer Society: www.computer.org
- Department of Electrical & Computer Engineering, Montana State University: www.ece.montana.edu

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\(^1\)University of Oregon. 2007. Created by intoCareers, a unit of the University of Oregon. Montana information Montana Career Information System. Discover: 2008 by ACT, Inc.

\(^2\) Montana State University Department of Computer & Electrical Engineering

\(^3\) Montana State University Career & Internship Services

\(^4\) O*Net: online.onetcenter.org

Number of graduates/number of respondents: 2012:7/4; 2011: 8/4; 2010: 6/4; 2009: 13/7