

WHAT COMPUTER ENGINEERS DO

Computer Engineering (CpE) – a combination of electrical engineering and computer science - deals with the study of computing ranging from microprocessors to supercomputers. Computer engineers are electrical engineers who specialize in either software design, hardware design or both. Specialization areas include:

- Microprocessor and Microcontroller Systems,
- Assembly Language Programming,
- Coding, Cryptography and Information Protection,
- Distributed Computing,
- Computer Vision and Pattern Recognition,
- Computer Graphics and Multimedia Applications,
- Internet Computing and Wireless Networks,
- Computer Architecture and Embedded Digital Systems Design,
- Network Security and Privacy, Real Time Systems,
- VLSI, VHDL and Application Specific Integration Chip (ASICs) design,
- Computer Internetworking and Network Protocols
- Embedded Software for real-time Microcontrollers,
- Algorithms Compilers and Operating Systems,
- Human Computer Interaction.

Computer Engineers do the following:

- Design the hardware components that power the latest technology and develop software that allows computers to implement complex applications. Developed systems improve the quality of life while keeping manufacturing costs low.
- Focus on the design of hardware and software systems that yield smaller, faster, cheaper and more powerful computers.
- Design products ranging from communications systems to imaging devices, consumer products, automotive microprocessors and household appliances.
- Coordinate the implementation, maintenance, and expansion plans of a company's computer systems.
- In automotive applications for example, computers are embedded into sixty different applications including AC, navigation, audio, video, and alert systems.

A Day in the Life of a Computer Engineer

- Computer engineers work on hardware, software and their interface.
- They work in teams with other engineers and with people from other disciplines.
- Their work requires tradeoffs between hardware and software to create products that are cost effective and useful.
- Work on evenings and/ or weekends is not unusual to meet deadlines.
- With today's technology, and as networks expand, more work can be done from remote locations through wireless networks and the Internet.

Most Computer Engineering Jobs are in the following places:

- Software Publishers,
- Engineering and Business Consulting Companies,
- Manufacturers of Computer and Peripheral Equipment,
- Management of Companies and Enterprises,
- Computer Systems Design and Data Processing Services Companies,
- Scientific research and development,
- Wired telecommunications carriers,
- Insurance carriers

Sample of Companies that Hire Computer Engineers:

- | | | |
|-----------------------|---------------------------------|---------------------------------|
| • Apple Computer | • NASA | • Federal Express |
| • AT&T | • NIS | • Ford |
| • Cisco Systems | • US Air Force, US Army | • Genentech |
| • Dell | • CIA | • General Dynamics |
| • Fujitsu Siemens | • US Department of Energy | • General Electric |
| • Google | • US Department of Defense | • General Motors Corporation |
| • Hewlett-Packard | • US Department of Transp. | • Honda |
| • IBM | • US Naval Research Lab | • Honeywell |
| • Intel | • US Navy | • Hughes Network Systems |
| • Iomega | • 3M Worldwide | • Johnson & Johnson |
| • Microsoft | • ADT | • Lockheed Martin |
| • Motorola | • Advanced Micro Systems | • Meade Instruments Corporation |
| • Oracle | • Alcatel | • Merrill Lynch & Co. |
| • Panasonic | • Alcoa | • New Piper Aircraft |
| • Peoplesoft (Oracle) | • Ansys | • Nuance Communications, Inc. |
| • Raytheon Company | • Applied Digital | • Procter & Gamble Company |
| • Sony Electronics | • BlackBerry | • Samsung |
| • Sun Microsystems | • BMW International | • Siemens Automotive |
| • Texas Instruments | • Boeing | • Toyota Motor Sales, Inc. |
| • Toshiba | • Delphi-Packard Electric | • UPS |
| • Verizon | • Toyota Motor Sales, USA, Inc. | • Westinghouse |
| • Yahoo | | |

JOB RELATED DATA

- BS degree new graduates receive starting offers averaging **\$52.5K** per year.
- MS and Ph.D. degree graduates average **\$60K** and **\$70K** per year.
- Median Annual Earnings for all CpEs were **\$75K** per year in 2004.

At Ohio University the three related majors have the following class distribution:

| CLASSES | ELECTR. ENG. MAJR | COMP. ENG. MAJR | COMP. SCIENCE MAJR |
|-----------------------------|-------------------|-----------------|--------------------|
| ELECTRICAL ENGIN. | 20 | 13 | 1 |
| COMPUTER ENGIN. | 2 | 8 | 3 |
| COMPUTER-SCIENCE | 2 | 6 | 15 |
| MATH/SCIENCE | 12 | 11 | 9 |
| GENERAL-EDUCATION | 6 | 6 | 7 |
| ENGLISH | 2 | 2 | 2 |
| FOREIGN LANGUAGE | | | 3 |
| OTHER (ME-CE) | 3 | 1 | 4 |
| Hardware-vs-Software | 90 / 10 | 70 / 30 | 30 / 70 |

References: <http://www.careercornerstone.org/pdf/software/software.pdf>
<http://www.answers.com/topic/computer-engineering>
<http://www.princetonreview.com/cte/profiles/dayInLife.asp?careerID=58>
<http://www.bls.gov/oco/ocos267.htm>