What can I do with a major in...
Computer Engineering

Computer engineers learn about the hardware and software aspects of computer science. They have a solid understanding of circuit theory and electronic circuits. Computer engineering is closely linked with electrical engineering, and is often found in the same department. Many undergraduate programs incorporate most of the core curricula in both electrical engineering and computer science so graduates will be prepared to work in either field. Usual tasks involving computer engineers include writing software and firmware for embedded microcontrollers, designing VLSI chips, designing analog sensors, designing mixed signal circuit boards, and designing operating systems. Computer engineers are also suited for robotics research, which relies heavily on using digital systems to control and monitor electrical systems such as motors, communications, and sensors.

Several specialty areas within computer engineering include:
- Coding, cryptography, and information protection
- Communications and wireless networks
- Compilers and operating systems
- Computational science and engineering
- Computer networks, mobile computing, and distributed systems
- Computer systems for architecture, parallel processing, and dependability
- Computer vision and robotics
- Embedded systems
- Integrated circuits, VLSI design, testing, and CAD
- Signal, image, and speech processing

INDUSTRIES
- Automation
- Communication technology
- Computer aided engineering
- Electronic components
- Government safety agencies
- Hardware design
- Hardware manufacturing
- High speed supercomputers
- Human genetics engineering
- Information technology
- Manufacturing
- Medical technologies
- Open systems control
- Semiconductors
- Software development
- Software systems
- Telecommunications

EMPLOYERS
- Adobe
- Amazon
- Artesyn Embedded Technologies
- Boston Scientific
- CenturyLink
- Cray Inc.
- Dell Compellent
- Fast Enterprises
- Ford Motor Company
- Google
- Honeywell
- IBM
- Medtronic
- Microsoft
- Open Access Technology International
- Open Systems International
- Seagate
- Trane
- Unisys
- UTC Aerospace Systems

TECHNICAL SKILLS
- C, C++
- Circuit Analysis
- Excel
- Java
- Mathematica
- MATLAB
- Python
- System Architecture

CSE Career Outcomes
Average Starting Salary: $70,842*
Post-graduation Outcomes:*
POSSIBLE POSITIONS

- **Database administrator**: Organize, track, and store information for businesses and other organizations. They also design and coordinate database security systems.

- **Electrical engineer**: Research, design, develop, test, or supervise the manufacturing and installation of electrical equipment, components, or systems for commercial, industrial, military, or scientific use.

- **Firmware engineer**: Design, create and maintain software used in electronic devices.

- **Hardware engineer**: Research, design, develop, and test computer hardware and supervise its manufacture and installation. Hardware refers to computer chips, circuit boards, computer systems, and related equipment such as keyboards, modems, and printers. The work is very similar to that of electronics engineers except computer hardware engineers work exclusively with computers and computer-related equipment.

- **Network systems and data communications analyst/specialist**: Plan, design, build, maintain, and test networks and other data communications systems.

- **Software engineer**: Applies the principles and techniques of computer science, engineering, and mathematical analysis to the design, development, testing, and evaluation of the software and systems that enable computers to perform applications. Software engineers must possess strong programming skills, but are more concerned with developing algorithms and analyzing and solving programming problems than with writing code.

**Some of these positions may require an advanced degree.**

GET INVOLVED

- Active Energy Club
- Association for Computing Machinery
- Association for Computing Machinery for Women
- CSE K-12 Outreach
- CSE Ambassadors
- CSE International Ambassadors
- Engineers Without Borders

- Eta Kappa Nu
- Institute for Electrical and Electronic Engineers
- National Society of Black Engineers
- Plumb Bob Honorary Leadership Society
- Science and Engineering Student Board

- Society of Asian Scientists and Engineers
- Society of Hispanic Professional Engineers
- Society of Women Engineers
- Solar Vehicle Project
- Tau Beta Pi
- TeslaWorks
- Theta Tau

RESOURCES

- American Council of Engineering Companies: acec.org
- American Council of Engineering Companies-MN chapter: acecmn.org
- Association for Computing Machinery: acm.org
- Computer Science Unplugged: csunplugged.org
- Computer Work: computerwork.com
- Department of Electrical and Computer Engineering: ece.umn.edu
- Dice: dice.com
- IEEE – Computer Society
- American Association of Artificial Intelligence: aaai.org
- IEEE – Computer Society: computer.org
- Institute of Electrical and Electronics Engineers: ieee.org
- Minnesota Society of Professional Engineers: mnspe.org
- National Society of Professional Engineers: nspe.org
- Society of Women Engineers: swe.org

See the Major Binders available in the CSE Career Center’s Resource Center for more information about this major and career.

*Salary and Career Outcomes gathered from the 2016-2017 CSE Graduation Survey*

Post-graduation outcomes reflect the percentage of students who were employed full-time in their field or were enrolled in a graduate program. For detailed starting salary information see the CSE Career Center website.