# Does a Computer Engineering Degree Teach You to Design Software or Hardware?

Prospective students searching for a start into the in-demand profession of computer design often search for a program that builds the skills needed for designing software and hardware with a computer engineering degree. In many cases, a computer engineering degree has courses for this design built into the program; in other programs, a specialization can be tailored to enable graduates to pursue a career in one specific area of the computer engineering field.

# General Coursework in a Computer Engineering Degree

Computer engineering majors complete several courses to fulfill various categories while pursuing a bachelor’s degree. In addition to general education courses, students also must successfully complete electrical engineering, computer engineering, general computer and mathematical, and computer engineering elective courses.

In many programs, the core computer engineering curriculum includes calculus, engineering analysis, and physics. Electrical engineering courses include electronic circuits, signals and systems, electrical engineering design, and logic design. Computer engineering courses often include computer architecture, digital system design, microcomputer systems, and C++. Other computer-based coursework could include probability, random processes, and computer programming with engineering. The range of electives varies greatly by program and institution, but common courses include operating systems, Unix, network security, and software engineering.

# Specializations in Computer Engineering

In addition to core and major coursework, many computer engineering programs offer students the option to complete specializations in a particular area of the field. Some of the typical specializations include multimedia, networking, embedded systems, architecture and design, communication systems, microelectronics, robotics, control systems, and electrical machines.

In addition to these specializations, most universities offering degrees in computer engineering also offer concentrations or advanced coursework in computer hardware or computer software development. Other institutions offer a computer systems specialization, which is a combination of hardware and software design. Coursework to complete this specialization includes classes such as logic design, software methodology, advanced programming, and a capstone design project. After completion of a computer engineering degree, graduates are able to build hardware, design software, or a combination of the two skill sets.

# Computer Engineering Certifications

In addition to a degree in computer engineering, future computer engineers have options for continuing to build skills and illustrate abilities in hardware building and software development and programming by completing certification or professional development courses. For example, a computer engineering professional might complete the Certified Software Development Associate credential. For additional information, visit the [Institute of Electrical and Electronics Engineers](http://www.computer.org/portal/web/certification).

# Careers in Computer Engineering

After completing a degree in computer engineering, graduates have built skills in mathematics, science, analysis, hardware, software, design, communications technology, and electronic systems. Overall, computer engineering graduates are able to work with all computer-based systems, giving them the general knowledge needed for all areas of working with computers.

Computer engineers often work for companies that produce computer equipment and software. Gaming companies, telecommunications firms, and other organizations that utilize computer technology also employ computer engineers.

Computer technology is an increasingly integral part of all aspects of society around the world, and the need for skilled, qualified professionals to complete a number of tasks related to the design and production of all types of software and hardware is in high demand. Once coursework is completed, graduates will have the ability for designing software and hardware with a computer engineering degree.