CAREER BRIEF

Computer Engineer

Computer engineers *research, design, develop, test, and oversee the manufacture and installation of computer hardware, including computer chips, processors, circuit boards, memory devices, computer systems, and other technological devices. While computer engineers work with operating systems and software, a key focus is hardware, from circuits to network architecture.*

Globally, the world is connected via computing systems. Many computer engineers design devices used in manufactured products that incorporate processors and other computer components and that connect to the Internet. Design must include secure technique and manufacture must include a secure supply chain. For example, automobiles, home appliances, and medical devices have Internet-ready computer systems built into them that must resist hacking.

EDUCATION

Many engineering careers currently require a bachelor's degree, and a master's degree may be recommended for those specializing or interested in leadership. Students may also start with a related associate degree before advancing to a bachelor's program. Learners are encouraged to participate in work-based experiences to gain practical skills in the industry sector they are interested in pursuing. All engineers need to keep up with the rapid advances in technology. Therefore, computer engineers continue learning throughout their careers.

WHERE THEY WORK

Computer engineers work in a variety of industries as there is a growing number of devices with processing boards embedded in them, such as household appliances, transportation services, and medical devices. They also design new applications for computers, such as advances in digital television, virtual meeting technology, intelligent highways, control systems, and new technologies for cars, phones, security systems, telescopes, airplanes, and space vehicles. Computer engineers can find employment working on embedded systems, integrated circuitry, signal processing, and information protection. Global companies in both the public and private sector employ computer engineers.

FUN FACTOIDS

The first webcam was utilized by Cambridge University. They used the webcam to watch a coffee maker, eliminating the need to make trips to an empty pot.

The first computer, named ENIAC, weighed over 27 tons. Doug Engelbart invented the first computer mouse in around 1964 which was made of wood.

The first ever hard disk drive was made in 1979 and could hold only 5MB of data.

WHERE TO FIND OUT MORE

Bureau of Labor Statistics Occupational Outlook Handbook I Computer Hardware Engineers [www.bls.gov]

IEEE Career Pathways I Computer Engineer [tryengineering.org]

National Initiative for Cybersecurity Education I Workforce Framework for Cybersecurity [www.nist.gov/nice]

WHAT'S THE SALARY?
$119,560 per year/$57.48 per hour
Bureau of Labor Statistics 2020 Median Pay

HIGH SCHOOL COURSES TO CONSIDER
Calculus, Linear Algebra, Differential Equations, Statistics, Chemistry, Physics, Computer Science, Networking

WHAT COURSES WILL I TAKE?
Circuit Analysis, Logic Design, Digital Systems Design, Computer Architecture, Mathematical Foundations of Computing, and Probability and Random Processes.

NICE FRAMEWORK WORK ROLES
Computer Engineers may have one or more work roles as described in the Workforce Framework for Cybersecurity. Some common work roles might include Security Control Assessor, Software Developer, Enterprise Architect, Security Architect, Research and Development Specialist, Testing and Evaluation Specialist, Information Systems Security Developer, Systems Developer, Systems Security Analyst, Cyber Defense Infrastructure Support Specialist