

Software Engineering

MEDIAN STARTING SALARY (FOR COMPUTER ENGINEERING): \$67,800

MEDIAN INCOME (FOR COMPUTER ENGINEERING): \$103,980



Software engineering is on the cutting edge of technology. As the world becomes more computerized, software engineering, a very progressive field, is in high demand. Software enables us to use computers. It is the translator between humans and computers. Without software, a computer would be nothing but ones and zeros.

Software engineers apply the principles and techniques of computer science, engineering, and mathematical analysis to the design, development, testing, evaluation, analysis, and maintenance of the software, apps, operating systems, compilers, and network distributions that enable computers to perform their many applications. In programming, or coding, software engineers instruct a computer, cell phone, and/or mobile device, line by line, how to perform a specific function. They must have strong problem solving and programming skills but may be more concerned with developing algorithms and analyzing and solving programming problems than with actually writing code. Anyone in this field must be prepared to be a life-long learner, because this field changes quickly as companies race to market with new ideas and concepts to stay on the cutting edge.

A popular branch of software engineering is coordinating, overseeing, and developing the growth, construction, and maintenance of a company's computer system. Engineers working in this capacity will assess each department's needs and make recommendations for intranets (hardwired or Wi-Fi), telephone systems, or other inter-company communication systems. They may also configure and install new systems, and train employees on the use of them. In addition, they may be a member of technical support and become experts at ensuring security.

The current demand for software engineers far exceeds the supply. The largest employers of software engineers include familiar names,

Job Outlook

Employment of software engineers, similar to computer engineers, is projected to grow 7 percent from 2012 to 2022, slower than the average for all occupations. A limited number of engineers will be needed to meet the demand for new computer hardware because more of the technology innovation takes place with software than with hardware.

Industries with the highest levels of employment in this occupation:

1. Computer Systems Design and Related Services
2. Semiconductor and Other Electronic Component Manufacturing
3. Computer and Peripheral Equipment Manufacturing
4. Scientific Research and Development Services
5. Navigational, Measuring, Electromedical, and Control Instruments Manufacturing

Top paying industries for this occupation:

1. Computer and peripheral equipment manufacturing
2. Semiconductor and other electronic component manufacturing
3. Computer systems design and related services
4. Navigational, measuring, electromedical, and control instruments manufacturing
5. Scientific research and development services

Source: US Bureau of Labor Statistics

such as Apple, Microsoft, Google, eBay, Facebook, Motorola, Autodesk, Blackberry, AOL, Sony, Adobe, Symantec, and Nintendo. This list is by no means exhaustive. To find more employers, simply look at who makes the software on any computer. There are thousands of software manufacturers that hire software engineers.

To prepare for a career in software engineering, you need to gain exposure to as many programming languages as possible. Popular job requirements include C/C++, Unix, OLE, Pearl, Java, PhP, Cisco, HTML, CGI Coding, Windows, and Novell. Go to the websites of the popular software engineer employers and check out their job postings to keep current with the inevitable rapid changes this industry will witness. Some software engineers develop both packaged systems and systems software or create customized applications. Visit the website of the Software Engineering Institute at www.sei.cmu.edu.

Glossary of Terms

Algorithm - a set of steps that are followed in order to solve a mathematical problem or to complete a computer process

Analyze - to study (something) closely and carefully : to learn the nature and relationship of the parts of (something) by a close and careful examination

Application - a program (as a word processor or a spreadsheet) that performs one of the major tasks for which a computer is used

Architecture - the organizational structure of a system or component

Coding - a set of instructions for a computer

Compatibility - the ease of combining software elements with others

Connectivity - the ability to connect to or communicate with another computer or computer system

Hardware - equipment used for a particular purpose; especially: computer equipment

Integrated - having different parts working together as a unit

Interface - a system that is used for operating a computer : a system that controls the way information is shown to a computer user and the way the user is able to work with the computer

Microchip - a group of tiny electronic circuits that work together on a very small piece of hard material (such as silicon)

Microprocessor - the device in a computer that manages information and controls what the computer does

Network - a system of computers and other devices (such as printers) that are connected to each other

Operating System - the main program in a computer that controls the way the computer works and makes it possible for other programs to function

Peripheral - connected to a computer but not an essential part of it

Portability - the ease of transferring software products to various hardware and software environments

Program - a set of coded operating instructions that are used to run a machine automatically

Prototype - an original or first model of something from which other forms are copied or developed

Robustness - the ability of software systems to react appropriately to abnormal conditions

Software - the programs that run on a computer and perform certain functions

ABET Accredited Programs in Software Engineering

School Name	Location	Website	Program and Degree Name
Auburn University	Auburn, AL, US	www.auburn.edu	Software Engineering, BSWE
California Polytechnic State University, San Luis Obispo	San Luis Obispo, CA, US	www.calpoly.edu	Software Engineering, BS
Clarkson University	Potsdam, NY, US	www.clarkson.edu	Software Engineering, BS
Drexel University	Philadelphia, PA, US	www.drexel.edu	Software Engineering, BS
Embry - Riddle Aeronautical University - Daytona Beach	Daytona Beach, FL, US	www.db.erau.edu	Software Engineering, BS
Fairfield University	Fairfield, CT, US	www.fairfield.edu	Software Engineering, BSE
Florida Institute of Technology	Melbourne, FL, US	www.fit.edu	Software Engineering, BS
Gannon University	Erie, PA, US	www.gannon.edu	Software Engineering, BS
Iowa State University	Ames, IA, US	www.iastate.edu	Software Engineering, BS
Milwaukee School of Engineering	Milwaukee, WI, US	www.msoe.edu	Software Engineering, BS
Mississippi State University	Mississippi State, MS, US	www.msstate.edu	Software Engineering, BS
Monmouth University	West Long Branch, NJ, US	www.monmouth.edu	Software Engineering, BSSE
Montana Tech of the University of Montana	Butte, MT, US	www.mtech.edu	Software Engineering, B.S.
Pennsylvania State University, Behrend College	Erie, PA, US	http://psbehrend.psu.edu	Software Engineering, BS
Rochester Institute of Technology	Rochester, NY, US	www.rit.edu	Software Engineering, BS
Rose-Hulman Institute of Technology	Terre Haute, IN, US	www.rose-hulman.edu	Software Engineering, BS
Southern Polytechnic State University	Marietta, GA, US	www.spsu.edu	Software Engineering, B.S.
The University of Virginia's College at Wise	Wise, VA, US	http://www.uvawise.edu	Software Engineering, B.S.
University of Michigan - Dearborn	Dearborn, MI, US	www.umd.umich.edu	Software Engineering, BS
University of Texas at Arlington	Arlington, TX, US	www.uta.edu	Software Engineering, BSSE
University of Texas at Dallas	Richardson, TX, US	www.utdallas.edu	Software Engineering, BS
University of Wisconsin - Platteville	Platteville, WI, US	www.uwplatt.edu	Software Engineering, BS