

# Florida Institute of Technology– Career Management Services

## Career Profile: Software Engineering & Computer Programming

Computer software engineers design and develop software. They apply the theories and principles of computer science and mathematical analysis to create, test, and evaluate the software applications and systems that make computers work. The tasks performed by these workers evolve quickly, reflecting changes in technology and new areas of specialization, as well as the changing practices of employers.

Software engineers design and develop many types of software, including computer games, business applications, operating systems, network control systems, and middleware. They must be experts in the theory of computing systems, the structure of software, and the nature and limitations of hardware to ensure that the underlying systems will work properly.

Computer software engineers begin by analyzing users' needs, and then design, test, and develop software to meet those needs. During this process they create flowcharts, diagrams, and other documentation, and may also create the detailed sets of instructions, called algorithms, that actually tell the computer what to do. They also may be responsible for converting these instructions into a computer language, a process called programming or coding, but this usually is the responsibility of *computer programmers*.

Computer software engineers can generally be divided into two categories: applications engineers and systems engineers. *Computer applications software engineers* analyze end users' needs and design, construct, deploy, and maintain general computer applications software or specialized utility programs. These workers use different programming languages, depending on the purpose of the program and the environment in which the program runs. The programming languages most often used are C, C++, Java, and Python. Some software engineers develop packaged computer applications, but most create or adapt customized applications for business and other organizations. Some of these workers also develop databases.

Computer software engineers are among the occupations projected to grow the fastest and add the most new jobs over the 2008-18 decade, resulting in excellent job prospects. Computer software engineers and programmers normally work in clean, comfortable offices or in laboratories in which computer equipment is located. Software engineers who work for software vendors and consulting firms frequently travel to meet with customers. Telecommuting is becoming more common as technological advances allow more work to be done from remote locations.

Most software engineers and programmers work 40 hours a week, but about 15 percent of software engineers and 11 percent of programmers worked more than 50 hours a week in 2008. The average starting salary for a bachelor's degree in computer engineering and computer programming is about \$64,563. The average starting salary for a master's degree in computer programming is \$72,515.



**For more information on a career in Software Engineering & Computer Programming contact the Career Management Services Office or your academic advisor.**

Sources: Occupational Outlook Handbook, Bureau of Labor Statistics [www.bls.gov/oco](http://www.bls.gov/oco)  
National Association of Colleges and Employers Salary Survey: Winter 2011



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