

Computer Software Engineer

COMPUTER SOFTWARE ENGINEERS

USE CREATIVE problem-solving ability as they apply the principles of computer science, engineering and math toward the design, development and testing of software and computer systems.

According to the *Occupational Outlook Handbook* from the U.S. Department of Labor's Bureau of Labor Statistics, computer applications software engineers analyze users' needs and design, construct and maintain general computer applications software or specialized utility programs. Computer systems software engineers coordinate the construction and maintenance of a company's computer system and plan their future growth.

The Workplace

Because our world is becoming increasingly computerized, computer software engineers can be found in more and more places—from large, multinational corporations to small, cutting-edge firms such as video game designers. They may also be found outside of the office, traveling to meet clients, providing support and service at a customer's facilities, or even telecommuting from home.

Educational Requirements

A bachelor's degree is preferred by most employers when it comes to hiring computer software engineers, and experience such as internships and co-op programs at colleges and technical schools can make a potential employee even more desirable to employers.

The *Occupational Outlook Handbook* notes that the usual degree concentration for applications software engineers is computer science or software engineering, and for systems software engineers, it is computer science or computer information

systems. Graduate degrees may be needed for more complex jobs and for promotion to higher-level jobs.

Earnings

According to the National Association of Colleges and Employers, salaries for graduates with computer engineering degrees entering the field were very good—averaging \$52,464 in 2005 for those with bachelor's degrees and \$60,354 for those with master's degrees.

The U.S. Bureau of Labor Statistics

reports that median annual earnings of full-time computer applications software engineers were around \$74,980 in 2004, and for computer systems software engineers, they were about \$79,740. Annual earnings for both areas of specialization were more than \$110,000 for the top 10 percent in the field.

Job Outlook

The outlook is so good for this field that *MONEY Magazine* placed computer software engineer at number one on its list of

CAREER CURVE

Vermont Technical College

THE COMPUTER ENGINEERING TECHNOLOGY

program at Vermont Technical College prepares students for careers in fields such as network administration, systems administration, hardware design and software engineering. Students in the program now have the option of obtaining an associate or a bachelor's degree, since the program transitioned to a four-year program in the fall of 2000.

Rich Warren is associate professor and past co-chair of the electrical/computer department at Vermont Technical College. Although he knows of at least one graduate who got a job as a software engineer with just his associate degree, most companies hire those with bachelor's degrees. And that particular student returned to the school to get his bachelor's when that option became available at Vermont Tech.

The associate degree curriculum focus-

es on fundamental technical principles, supplemented by practical exposure to hardware and software applications from a systems perspective. Students study object-oriented programming; networking; embedded systems and computer interfacing; digital hardware systems; and system administration.

The bachelor's degree program is a "2+2" program that builds on any accredited two-year associate degree in computer engineering technology. It focuses on more advanced skills and offers what Vermont Tech describes as a balanced treatment of hardware, software and systems administration topics. These include embedded system design; operating systems programming; network programming; complex digital designs; software engineering; working knowledge of computer architectures; database sys-

the top 10 best jobs in 2006, noting that computer software engineers are needed in virtually every part of the economy.

According to the U.S. Bureau of Labor Statistics, computer software engineers are projected to be one of the fastest-growing occupations from now until 2014 due to rapid employment growth in the computer systems design and related services industry. Rapidly evolving technologies will also result in new areas of growth for the field. **I**

Explore More

Here are some places to turn for more information about education and training as a computer software engineer.

The Accreditation Board for Technology and Engineering
www.abet.org

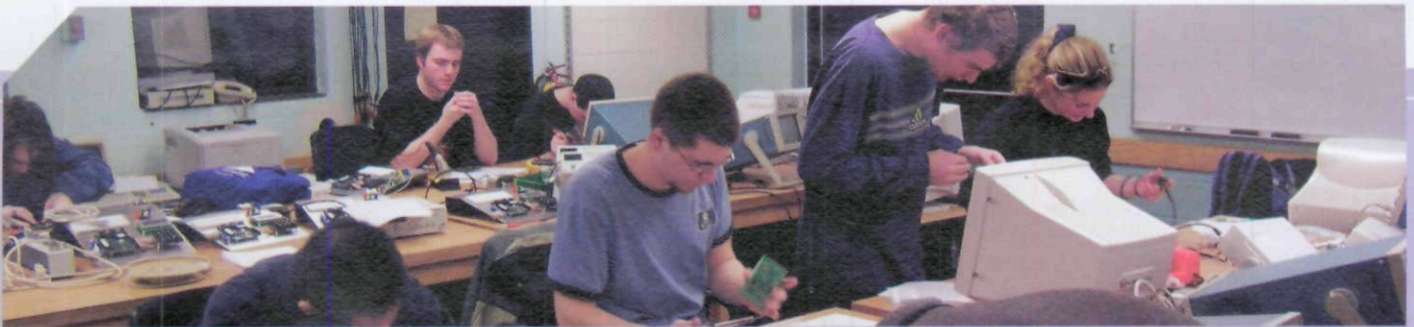
The Association for Computing Machinery
www.acm.org

The Association for Information Systems
www.aisnet.org

The Computer Technology Industry Association
www.comptia.org

The Institute of Electronics and Electrical Engineers Computer Society
www.computer.org

The National Workforce Center for Emerging Technologies
www.nwcef.org



▲▲ Two's Better than One

At Vermont Technical College, students in the computer engineering technology program learn about both hardware and software to better prepare them for future employment.

tems; and digital signal processing.

One of the things Warren believes makes the Vermont Tech computer engineering technology program so strong is that it also focuses on hardware and on embedded systems.

"We have two microprocessor courses, which give students a really good background in embedded systems, because a lot of the software that you see now is not just running on a PC, but on some little device you can hold in your hand or on something that controls machinery in some process at a plant," Warren explains.

Since the students graduate with a strong background in both hardware and software, Warren notes that, "When they get to the first career position, they are not in the dark when someone says, 'We need to interface to this particular microprocessor,' or, 'We're going to use a digital signal processor.'"

The overall placement rate for the school is more than 98 percent, and the computer engineering program certainly has a good job placement record.

However, Warren notes, "We're finding employers are beginning to have more desire for the bachelor's degree. We have an advisory committee of people in the field, and many of them are software engineers. We meet every year in April, and when we have asked them in the past two or three years, which they are hiring, they tell us

that they really prefer those with bachelor's degrees."

But now, thanks to the bachelor's degree option at Vermont Technical College, Warren says that those with associate degrees can return to the school to upgrade their skills, their degrees and their career options—and many are doing just that. If *MONEY Magazine* is correct in its assessment of computer software engineer as the hottest job in 2006, the opportunities will certainly be there for students who take advantage of the strength and breadth of the education offered by Vermont Technical College's computer engineering technology program.

For more information about Vermont Technical College, visit www.vtc.edu.

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