

DELTA COLLEGE  
COUNSELING/ADVISING & CAREER SERVICES  
**COMPUTER ENGINEER**

Salary Range: \$49,350 - \$135,260 annually.

Personal Interests: Activities relating to processes, machines and methods.

Work Environment: Office setting, using a computer; may work at home and travel frequently. May also work in laboratories, manufacturing facilities, classrooms or customer

**Description**

Computer engineers work with the hardware and software aspects of systems design and development. They usually apply the theories and principles of science and mathematics to design hardware, software, networks, and processes and to solve technical problems. Whereas their work emphasizes the application of theory, computer engineers are also involved in building prototypes. They often work as part of a team that designs new computing devices or computer-related equipment, systems or software.

Computer hardware engineers design, develop, test and assist in the manufacturing of computer components, products and systems, such as chips or device controllers. They plan the systems concept and the hardware needs for a particular computer product by analyzing the market needs and prepare a forecast which defines specification, the technology to be used and the method, a sales plan and an initial financial product plan. They fabricate and test theoretical models of computer products and build working prototypes of the computer equipment. Computers are found in nearly all commercial, industrial, educational, health care, government and research settings. The work of computer hardware engineers affects a vast segment of the world population.

Software engineers, on the other hand, can be involved in the design and development of software systems for control and automation of

manufacturing, business, and management processes. They may research, design, and test operating system software, compilers, and network distribution software. Software engineers working in applications development analyze users' needs and design, create, and modify general computer applications software or specialized utility programs. These professionals also possess strong programming skills, but they are more concerned with analyzing and solving programming problems than with writing code for programs. Some software engineers develop both packaged and systems software or create customized software applications for clients. They design general computer application software, such as spreadsheet, word processing, graphics and communications software products.

**Working Conditions**

Computer engineers work in pleasant offices, which are well-lighted and air conditioned. Hardware engineers may also spend time in well-equipped laboratories, manufacturing facilities, classrooms or customer worksites. Software engineers may work at home or away from the office and may travel frequently to develop software for customers.

One of the pressures of the job is keeping current with continuously developing technologies. Additional time beyond a 40-hour work week may be spent studying technical journals, attending seminars or taking training in

order to keep up with changing technology affecting the field.

### **Training, Other Qualifications**

Computer engineering typically requires a bachelor's degree, but graduate studies are also available at the master's and professional level. Several Michigan universities offer a bachelor's degree in computer engineering. Delta College offers a pre-engineering curriculum that can be used to transfer to a bachelor degree program. Interested students need to check with Counseling & Academic Advising to find out which universities and colleges have a transfer agreement with Delta College.

### **Job Outlook**

Nationally, there were about 800,000 computer engineers (including software and hardware engineers) employed in 2004. There are about 14,470 computer software engineers employed in Michigan. Most computer engineers worked in urban areas including the Detroit metropolitan area and Ann Arbor, many in support of the automotive industry. Employment of computer engineers in Michigan is expected to increase much faster than the average for all occupations through the year 2014. An average of 740 openings is expected annually. Graduates with bachelor degrees in computer science, computer engineering, electrical or electronic engineering, information science, or information systems should have good employment prospects.

### **Earnings**

Earnings of computer engineers depend on the engineer's experience, capabilities, job responsibilities, and education, and on the type, size, and location of the employing organization.

Computer hardware engineers' annual salaries in early 2006 were:

	<b>Average</b>	<b>Range</b>
National	\$91,280	\$53,910-\$135,260
Michigan	\$72,650	\$44,210-\$110,170

Earnings of software engineers vary with the employer and geographic location. For instance, salaries in California tend to be much higher than in Florida. California, Washington and Oregon have many opportunities for software engineers because of the large computer firms located in these areas. In Michigan, earnings of software engineers were competitive with national earnings. For example, average annual salaries in early 2005 were:

<b>Job Title</b>	<b>Average</b>	<b>Range</b>
National	\$82,000	\$49,350-\$119,770
Michigan	\$74,320	\$76,100-\$104,690

### **Related Occupations**

Electrical and Electronic Engineer, Computer Programmer, Computer Systems Analyst and Network Engineer.

Computerengineer.doc SC 9/07  
Sources: Occupational Outlook Handbook, Michigan Occupational Information System.

Career Center, D 132  
Bay City/Saginaw: (989) 686-9072  
Midland/Auburn: (989) 495-4000, Ext. 9072  
Frankenmuth, Birch Run, Reese & Vassar: (989) 758-3400, Ext. 9072  
<http://www.delta.edu/careercenter>

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