

# Women in High-Tech Jobs

## Why is there is so much excitement about “high-tech” in today’s economy?

Over the past decade, high-tech jobs have shown substantial growth. Women, therefore, need to recognize that in addition to paying well, these jobs are keys to the changing economy of the Twenty-First Century and should receive serious consideration as career choices. Projections for future growth indicate that computers, software, and applications for information technology will continue to have a substantial impact on lives and employment opportunities in the United States.

Use of the Internet and wireless technologies has exploded, creating phenomenal growth and new challenges for manufacturers of this equipment. “High-tech,” however, goes beyond computers, software, and the Internet. A broad spectrum of industries and occupations are considered “high-tech.”

What does “high-tech” or “high-technology” mean in the United States today? The term “high-tech” is used today to describe industries, occupations and products in which cutting-edge, state-of-the-art technologies are used. The technologies shape the design, development, and introduction of new products and innovative production processes. As high-technology firms systematically apply scientific and technical knowledge to problem solving, they conduct a substantial amount of research and development. Therefore, many of their employees have a scientific, technical or engineering background.

In the July 2005 issue of the Monthly Labor Review, the Bureau of Labor Statistics (BLS) described “high-technology” occupations as scientific, engineering, and technician occupations, such as: computer & mathematical scientists; engineers; life & physical scientists; mathematical specialists; engineering & science technicians; computer specialists; and engineering, scientific, & computer managers. Individuals employed in these occupations are collectively referred to as technology-oriented workers. Workers in these occupations need in-depth knowledge of the theories and principles of science, engineering, and mathematics acquired through post-secondary specialized education ranging from an associate degree to a doctorate.

In addition to the occupations defined as high-tech, there are also high-tech aspects of many other occupations. For example, many workers operate and repair products used in high-tech industries. These include computer and office machine repairers, aircraft pilots, and radiological technologists and technicians. Most of these occupations require an associate degree or higher. For some, however, certification by hardware and software producers act as a substitute for formal academic education.

Estimates for the year 2014, developed by BLS, project that high technology employment will reach 9.7 million jobs—roughly 6 percent of the 164 million total persons employed in non-farm wage and salary jobs. High-tech occupations offer high pay. In 2004, median weekly earnings for workers in technology-oriented occupations ranged between \$526-\$1,878, and averaged \$1,156, which was more than the median for all occupations (\$746).

Between the 2004-2014 period, the number of network systems & data communication analysts is projected to increase by nearly one-fourth, adding nearly 119,000 jobs. High technology growth will account for almost four percent of all projected growth during the period.

*Source: Women’s Bureau, Office of Occupational Statistics and Employment Projections, U.S. Department of Labor*

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## **How great a disparity is there between the number of women and men employed in high-tech occupations?**

Clinical laboratory technologists and technicians were the only two technology-oriented occupations in which more women were employed than men in 2005. According to 2005 Current Population Survey (CPS) data, one out of ten employed engineers was a woman, while two of ten employed engineering technologists & technicians were women. Among engineering specialties—architectural, engineering technicians, industrial and civil were the only occupations in which women were more highly represented than the overall percent of total women engineers. Women made up 24 percent of all architectural engineers, 19 percent of engineering technicians, 15 percent of industrial engineers, and 13 percent of all civil engineers. Among other engineering specialties—aerospace, computer hardware, electrical & electronic, and mechanical—women represented fewer than 11 percent.

At the same time, three out of ten computer scientists & systems analysts, computer support specialists, and operation research analysts were women. In addition, one out of four computer programmers were women. Among natural scientists, women represented 44 percent of medical scientists and 46 percent of biological scientists, but accounted for a smaller portion of environmental scientists & geodesists (24 percent) and chemists & materials scientists (33 percent).

## **What does the projected growth in high-tech occupations mean for women?**

Between the 2004-2014 period, network systems & data communication analysts are projected to have the fastest growth among high-tech occupations—126,000 such workers will be added from the 2004 figure. In addition, the total number of computer software engineers (applications & systems software) is expected to increase by nearly 50 percent (375,000 jobs). If women continue to make up over two out of ten network systems & data communication analysts, then an estimated 30,000 more women could be employed as network systems analysts & data communication analysts by 2014. If women continue to be represented in computer software engineer jobs in the same proportion as 2005, one out of five, then nearly 80,000 more women may expect to be employed as computer software engineers by 2014.

## **What are the educational requirements for these high-tech occupations?**

Most high-tech occupations, including network systems analysts, computer software engineers, network & database administrators, physician assistants, and biomedical scientists generally require a bachelor's degree or higher, or work experience in addition to the degree requirements. Medical scientists are often required to have doctorate degrees because many of them work in basic research calling for extensive knowledge of their fields. Computer support occupations, science and engineering technologist & technicians usually require two years of specialized training, an associate degree, or certification.

## **What can we conclude?**

There was a growth surge in high-tech industries, occupations, and educational preparation for these occupations in the 1990's and the future appears to hold opportunities for employment growth in the high-tech sector and among high-tech occupations. Employment of women has lagged in most of the high-tech occupations that show promise for future growth.

Software and hardware providers have gained acceptance as mechanisms for preparing high-technology workers for employment opportunities in the field. The challenges for women, then, are to find more pathways into high-tech occupations, and into opportunities in the new certification universe. They also need to take greater advantage of traditional educational opportunities and to enter high-tech occupations in greater numbers. The challenge for women is to explore educational and training opportunities that will lead them to high-tech careers.