

Understanding the Local Labor Market

Promising Career Pathways in Pittsburgh and Allegheny County

Focus: Engineers

Understanding the Local Labor Market: Promising Career Pathways in Pittsburgh and Allegheny County is intended as a useful resource for career counselors and other professionals responsible for helping jobseekers make informed decisions about employment and training. Featured occupations are selected on the basis of vacancies, wages and benefits, and opportunities for advancement.

What do engineers do?

- Engineers use the principles of science and mathematics to create economical solutions to technical problems.
- Most engineers specialize. High-demand specialties include:
 - *Biomedical engineers* who develop devices and procedures that solve medical and health-related problems;
 - *Electrical and electronics engineers* who design, develop, test, and supervise the production of electrical and electronic equipment;
 - *Environmental engineers* who use science and engineering principles to develop solutions to environmental problems;
 - *Industrial engineers* who determine the most effective ways for an organization to use people, machines, materials, information, and energy to create a product or provide a service;
 - *Mechanical engineers* who research, develop, design, manufacture, and test tools, engines, machines, and other mechanical devices.
 - *Nuclear engineers* who research and develop the processes, instruments, and systems used to derive benefits from nuclear energy and radiation.
- Other engineering specialties to consider are: manufacturing engineers, computer hardware/software engineers, civil engineers, chemical engineers, and health and safety engineers.

What are wages, benefits, and work conditions for engineers?

- Engineers typically work a 40-hour week, although they may have to work overtime. Some engineers travel extensively to projects or worksites. Most engineers regularly use computers and work in office buildings, laboratories, or plants.
- As shown in the table below, the average annual wages for engineers in high-demand specialties within Allegheny County range between \$68,480 (mechanical engineers) to \$75,260 (industrial engineers).

What do engineers like about their jobs?

- Engineers enjoy developing, designing, and constructing products that will improve society.
- They enjoy problem solving and the creative energy that comes with developing solutions to complex problems.
- They like collaborating with other people on projects.
- They enjoy the level of precision and detail that comes with working in a technical occupation.

What are advancement opportunities and related occupations?

- Engineers may advance to chief engineers, technical specialists, or engineering managers. Computer-related engineers may become contractors or systems analysts.
- Licensure as a Professional Engineer can provide increased opportunities for job mobility and earnings.
- Related occupations include: architects; natural science managers; computer and information systems managers; computer programmers; mathematicians; drafters; engineering technicians; and physical and life scientists.

How many engineering openings are there?

- The PA Department of Labor and Industry estimates that there are approximately 9,340 engineers employed in Allegheny County. Employment is expected to remain steady through 2012.
- In the chart below, the number of annual job openings represents the number of positions expected to be available in the respective engineering specialty.
- Openings in most of these specialties are due to replacement of the current workforce and not to growth. In environmental and mechanical engineering, openings are mostly due to growth.
- 123 local engineering jobs were posted on the Pittsburgh/Allegheny County CareerLink website (www.careerlinkpittsburgh.com) in the first quarter of 2006.

STATISTICS FOR HIGH-DEMAND ENGINEERING SPECIALTIES IN ALLEGHENY COUNTY: WAGES, EMPLOYMENT, AND JOB OPENINGS

ENGINEERING SPECIALTY	AVERAGE ANNUAL WAGE	2002 ESTIMATED EMPLOYMENT	PROJECTED EMPLOYMENT 2012 ¹	ANNUAL JOB OPENINGS
Biomedical Engineers	\$70,410	130	160	5
Electrical and Electronics Engineers	\$72,360	1610	1550	25
Environmental Engineers	\$69,670	290	370	13
Industrial Engineers	\$75,260	1180	1190	30
Mechanical Engineers	\$68,480	1480	1530	45
Nuclear Engineers	N/A	1150	970	16

¹ 2012 projections are based upon 2002 estimates.

FOCUS: Engineers

How can I become an engineer?

- A bachelor's degree is required for almost all entry-level positions. Most engineering degrees are granted in electrical, electronics, industrial, or mechanical engineering.
- Admissions requirements for undergraduate engineering schools include a solid background in mathematics (algebra, geometry, trigonometry, calculus) and science (biology, chemistry, and physics) with courses in English, social studies, and the humanities. Computer proficiency is required.
- A bachelor's degree can be earned through: a four or five-year accredited college or university program; two years in a community college transfer program plus two or three years in an engineering program; or three years in a science or mathematics major and two years in an engineering program.
- In addition to the standard engineering degree, many colleges offer two and/or four year degree programs in engineering technology. These programs prepare students for practical design and production work, rather than for jobs that require more theoretical and scientific knowledge.
- All 50 states and the District of Columbia require licensure for engineers who offer their services directly to the public. While laws vary from state to state, the general process includes graduation from an accredited engineering program and completion of the Fundamentals of Engineering (FE) examination. This, typically, qualifies for certification as an Engineer-In-Training (EIT).
- After four years of engineering experience with a Professional Engineer (PE), an EIT may sit for the Professional Engineering Examination. Passage of this examination leads to licensure as a Professional Engineer.
- Women and minorities are encouraged to pursue and apply for engineering jobs.

How do I find out about engineering jobs?

- **Pittsburgh/Allegheny County CareerLink** has job postings for these positions (contact 1-866-317-JOBS or visit www.careerlinkpittsburgh.com to learn more).
- **American Council of Engineering Companies** has a website (www.acec.org) with a job board for engineers.
- **Advanced Manufacturing Career Collaborative (AMC²)** provides information on engineering and manufacturing careers in Southwestern Pennsylvania. (www.amcsquared.com)

Remember...

Labor markets are affected by economic, social, and institutional factors that are difficult to predict. No one can forecast perfectly how many jobs will be available, or whether there will be too many or too few workers to fill those jobs. The reality is that employment is never a guarantee, even for individuals who pursue training in demand occupations.

The Three Rivers Workforce Investment Board (TRWIB) is charged with promoting a coordinated and accountable employment and training system for Pittsburgh and Allegheny County. Responsibilities include setting and monitoring local performance standards, chartering CareerLink comprehensive and community centers that provide a range of services to jobseekers and employers, and certifying qualified training providers. Board members are appointed by Mayor Bob O'Connor (City of Pittsburgh) and Chief Executive Dan Onorato (Allegheny County).

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Where can I get training locally?

Carlow University — www.carlow.edu, 412-578-6600.

In partnership with Carnegie Mellon University, Carlow University offers a five-year course of study that leads to a BS in Engineering.

Carnegie Mellon University, College of Engineering — www.cit.cmu.edu, 412-268-2000.

Offers undergraduate and graduate degrees in Engineering.

Chatham College — www.chatham.edu, 412-365-1819.

Offers a 3-2 program with Carnegie Mellon University and Penn State University. It has a less formal arrangement with the University of Pittsburgh.

Community College of Allegheny County (CCAC) — www.ccac.edu, 412-237-4600.

Offers a program that prepares students for transfer to a four-year institution with a broad college background and skill and knowledge in Engineering Science.

Duquesne University — www.duq.edu, 412-396-6093.

Offers a 3-2 program with Case Western Reserve and the University of Pittsburgh.

La Roche College — www.laroche.edu, 412-536-1275.

Offers a 3-2 program with the University of Pittsburgh's School of Engineering.

Penn State—McKeesport — www.mk.psu.edu, 412-675-9000.

The first two years of the engineering degree may be started here and completed at the University Park campus.

Point Park University — www.pointpark.edu, 1-800-321-0129.

Offers a bachelor's degree in Engineering Technology.

Robert Morris University — www.rmu.edu, 412-262-8228.

Offers undergraduate and graduate degrees in Engineering.

University of Pittsburgh — www.engr.pitt.edu, 412-624-9825.

Offers undergraduate and graduate degrees in Engineering.

Can I get help paying for training?

- Limited training funds may be available through **Pittsburgh/Allegheny County CareerLink**.
- Women and minorities are encouraged to apply for scholarships.
- Colleges and universities may offer financial aid.

