

Career Focus on...

Basic Engineering

Introduction

- Do you like to solve problems and focus on making things work more efficiently and effectively?
- Do you enjoy science (biology, chemistry, and physics) and mathematics (algebra, geometry, trigonometry, calculus, linear algebra, & differential equations)?
- Would you like to design equipment and technology that meet the needs of the user, such as medical equipment, computer hardware, electric motors, robots, biomaterials, and bridges and roads?
- Do you have the ability to imagine how something will look if it is moved around or its parts are rearranged?
- Are you creative, inquisitive, analytical, and detail oriented?

If you've answered yes to these questions, you may want to consider a career in engineering, biomedical engineering, or biotechnology.

Did You Know... ?

- In 2008, engineers held about 1.5 million jobs and are employed in every state, in cities large and small.
- As a group, engineers earn some of the highest average starting salaries among those holding bachelor's degrees.
- Most engineers specialize. The Federal Government's Standard Occupational Classification (SOC) system identifies 17 separate engineering specialties (e.g., aerospace, chemical, environmental, mechanical, biomedical, etc.).
- Overall engineering employment is expected to grow by 11 percent over the 2008-18 decade, with environmental engineering (31%) and biomedical engineering (21%) expected to lead the way.
- A bachelor's degree in engineering is required for most entry-level jobs, and continuing education is critical for engineers as technology evolves.
- Engineers are key to the U.S. Environmental Protection Agency's plan to reduce pollution and create a healthier environment. Read more about "Green Engineering" at www.epa.gov/oppt/greenengineering/index.html

QCC Alumni Success Story

Adrian Avant's interest in engineering began as he worked in metal shops and wood shops. Adrian was always interested in making things work better. Adrian decided to attend Quinsigamond Community College because it was the only local college that offered a degree in engineering that was affordable. He began his education knowing he would transfer to a 4 year institution for a Bachelors of Science degree.

Although Adrian started off needing developmental Math he found that the courses strengthened both his math abilities and interest. Throughout his education he utilized the math lab tutoring center. He found the assistance of the tutors "incredible." In fact as a QCC graduate he is now employed as a math tutor. Adrian completed his Basic Engineering degree in August 2008.

Adrian was accepted into WPI with a scholarship as a Junior in the Mechanical Engineering degree program and began his studies in January 2009. He feels the engineering background he received at QCC prepared him to be successful at WPI. He believes he gained a solid foundation in the critical principles of engineering and math, and learned how to utilize resources to solve problems.

Career Options

MECHANICAL DRAFTERS

Median Annual Salary: \$48,600

Recommended Education: Post-High School certificate, Associate's Degree

www.bls.gov/oco/ocos111.htm

GEOLOGICAL/PETROLEUM TECHNICIANS

Median Annual Salary: \$57,080

Recommended Education: Associate's Degree, Bachelor's Degree

www.bls.gov/oco/ocos115.htm

ENVIRONMENTAL ENGINEER

Median Annual Salary: \$77,970

Recommended Education: Bachelor's Degree

www.bls.gov/oco/ocos027.htm

ELEC./ELECTRONICS ENGINEERING TECHNICIANS

Median Annual Salary: \$56,560

Recommended Education: Associate's Degree

www.bls.gov/oco/ocos112.htm

BIOMEDICAL ENGINEER

Median Annual Salary: \$81,120

Recommended Education: Bachelor's Degree

www.bls.gov/oco/ocos027.htm

MECHANICAL ENGINEER

Median Annual Salary: \$78,200

Recommended Education: Bachelor's Degree

www.bls.gov/oco/ocos027.htm

COMMERCIAL AND INDUSTRIAL DESIGNERS

Median Annual Salary: \$61,580

Recommended Education: Bachelor's Degree

www.bls.gov/oco/ocos290.htm

COMPUTER ENGINEER

Median Annual Salary: \$100,180

Recommended Education: Bachelor's Degree

www.bls.gov/oco/ocos027.htm

CHEMICAL ENGINEER

Median Annual Salary: \$88,760

Recommended Education: Bachelor's Degree

www.bls.gov/oco/ocos027.htm

QCC Alumni Success Story (continued)

Beyond the Engineering curriculum Adrian was involved in the VEX Robotic program where he mentored High School students, exposing them to the possibilities in the field through the experience of the competitions.

After graduating from WPI Adrian would like to use his skills to innovate and design new products and perhaps to eventually gain a higher level degree and become a teacher.

Other Professionals in the Field

Jennifer Nakayama is the Manager of Design & Engineering at SeaWorld, San Diego. In this role she oversees planning and design of new construction at the theme park. She coordinates these projects with other departments at SeaWorld to ensure their success. Jennifer says, "It takes teamwork and collaboration from others to make a project in the 'real world' work for everyone, not just the engineer." She has been interested in math and science from an early age, when she competed in school science fairs. She enjoys the feeling of accomplishment she gets from solving problems and completing projects. Jennifer's primary interest is in water quality, which she says affects all aspects of SeaWorld. When asked what engineering problem she would most like to solve, she responds, "I'd like to tackle global sustainability. This would include innovative planning for our natural resources, like air and water, and the subsequent infrastructure to sustain development. As our Earth continues to develop and become more and more populated, there is a need for collective planning across the globe." Jennifer holds a Bachelor's of Science degree in Environmental Engineering, and a Master's of Science in Civil Engineering. To read more about her and other women engineers, go to <http://www.engineergirl.org/CMS/WomenEngineers.aspx>

Next Steps

Wondering if the field of Engineering is right for you?

- Take a Career Assessment to match your interests with potential careers: www.qcc.mass.edu/t3/ort/sites.html#careerassess
- Research the web links on this page and more: www.qcc.mass.edu/t3/ort/sites.html#careerinfo
- Conduct an Informational Interview. Speak with a live person employed in this field: www.qcc.mass.edu/t3/ort/sites.html#infointerview
- Attend a Career Planning Session: www.QCC.edu/images/capsession.pdf
- Speak with an Advisor: www2.qcc.mass.edu/advising/advCal/advCal/asp
- Speak with QCC Faculty who teach Basic Engineering courses.

Sources Used

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2010-11 Edition*:

- Commercial and Industrial Designers, on the Internet: www.bls.gov/ocol/ocos290.htm
- Drafters, on the Internet: www.bls.gov/ocol/ocos111.htm
- Engineering Technicians, on the Internet: www.bls.gov/ocol/ocos112.htm
- Engineers, on the Internet at www.bls.gov/ocol/ocos027.htm
- Science Technicians, on the Internet: www.bls.gov/ocol/ocos115.htm
- Tool and Die Makers, on the Internet: www.bls.gov/ocol/ocos225.htm

The National Academy of Engineering. "Engineer Girl!": www.engineergirl.org

Professional Associations

American Society for Engineering Education:

www.asee.org

National Society of Professional Engineers:

www.nspe.org

American Institute of Chemical Engineers:

www.aiche.org

IEEE Computer Society: www.computer.org

IEEE Women in Engineering (WIE):

[www.ieee.org/web/membership/women/index.html?](http://www.ieee.org/web/membership/women/index.html?WT.mc_id=WIE_nav1)

[WT.mc_id=WIE_nav1](http://www.ieee.org/web/membership/women/index.html?WT.mc_id=WIE_nav1)

SAE International: www.sae.org

Society of Women Engineers:

societyofwomenengineers.swe.org

Employment Opportunities for Graduates in this Field

QCC's Basic Engineering program is designed as a transfer program. This means that students graduating from Basic Engineering generally transfer on to a four-year college or university to complete at least a bachelor's degree in engineering. After completing their bachelor's degree students work for a wide variety of employers in the Worcester area and beyond.

Looking for employment, co-op, internship, or service learning opportunities?

Contact the Career Placement Office:

www.QCC.edu/pages/Career_Placement.html

Possible Transfer Schools

- California Institute of Technology
- Georgia Institute of Technology
- Northeastern University
- Rensselaer Polytechnic Institute
- Rochester Institute of Technology
- UMass Amherst
- UMass Dartmouth
- UMass Lowell
- Worcester Polytechnic Institute (WPI)

Looking for Specific Transfer Information?

- Start at the QCC Transfer web site: www.qcc.mass.edu/transfer
- Make an appointment online with the Transfer Advisor: www.qcc.mass.edu/transfer/calendar
- Email questions to: transfer@qcc.mass.edu