

# Career Profile

A weekly series devoted to providing information on career exploration

## Do You Like

- Using mathematics or scientific rules and methods to solve problems?
- Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions?
- Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems?
- Talking to others to convey information effectively?

*Then This Could Be The Career For You!*

## The Type of Work

- Read and interpret blueprints, technical drawings, schematics, and computer-generated reports.
- Assist drafters in developing the structural design of products using drafting tools or computer-assisted design (CAD) or drafting equipment and software.
- Research, design, evaluate, install, operate, and maintain mechanical products, equipment, systems and processes to meet requirements, applying knowledge of engineering principles.
- Confer with engineers and other personnel to implement operating procedures, resolve system malfunctions, and provide technical information.
- Recommend design modifications to eliminate machine or system malfunctions.
- Conduct research that tests and analyzes the feasibility, design, operation and performance of equipment, components and systems.
- Investigate equipment failures and difficulties to diagnose faulty operation, and to make recommendations to maintenance crew.
- Develop and test models of alternate designs and processing methods to assess feasibility, operating condition effects, possible new applications and necessity of modification.
- Develop, coordinate, and monitor all aspects of production, including selection of manufacturing methods, fabrication, and operation of product designs.
- Specify system components or direct modification of products to ensure conformance with engineering design and performance specifications.

## Pathways to Success

**A bachelor's degree in engineering is required for almost all entry-level engineering jobs.** Most engineering degrees are granted in electrical and electronics engineering, mechanical engineering, and civil engineering. However, engineers trained in one branch may work in related branches. It also allows engineers to shift to fields with better employment prospects or to those which more closely match their interests.

Most engineering programs involve a concentration of study in an engineering specialty, along with courses in both mathematics and the physical and life sciences. Many programs also include courses in general engineering. A design course, sometimes accompanied by a computer or laboratory class or both, is part of the curriculum of most programs. Often, general courses not directly related to engineering, such as those in the social sciences or humanities, also are required.

In addition to the standard engineering degree, many colleges offer 2-year or 4-year degree programs in engineering technology. These programs, which usually include various hands-on laboratory classes that focus on current issues in the application of engineering principles, prepare students for practical design and production work, rather than for jobs that require more theoretical and scientific knowledge.

### Individuals who possess knowledge in:

- Engineering and Technology -the practical application of engineering science and technology.
- Design - design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models.
- Mechanical - machines and tools, including their designs, uses, repair, and maintenance.
- Mathematics - arithmetic, algebra, geometry, calculus, statistics, and their applications.
- Physics - prediction of physical principles, laws, their interrelationships, and applications to understanding fluid, material, and atmospheric dynamics, and mechanical, electrical, atomic and sub-atomic structures and processes.
- Production and Processing - raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.
- Computers and Electronics - circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.
- Customer and Personal Service - principles and processes for providing customer and personal services.
- Administration and Management - business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.

## What Employers Look For

## Job Outlook

**In 2008, engineers held about 1.6 million jobs.**

About 36 percent of engineering jobs were found in manufacturing industries, and another 30 percent were in the professional, scientific, and technical services industries, primarily in architectural, engineering, and related services. Many engineers also worked in the construction, telecommunications, and wholesale trade industries.

Overall engineering employment is expected to grow by 11 percent over the 2008-18 decade, about as fast as the average for all occupations. Engineers traditionally have been concentrated in slower growing or declining manufacturing industries, in which they will continue to be needed to design, build, test, and improve manufactured products. However, increasing employment of engineers in engineering, research and development, and consulting services industries should generate most of the employment growth.

# MECHANICAL ENGINEER

**NAME:** Dennis Barrett  
**JOB TITLE:** Mechanical Engineer  
**COMPANY:** Lee's Grinding, Inc.  
**LOCATION:** Strongsville, Oh



### DEFINITION:

Perform engineering duties in planning and designing tools, engines, machines, and other mechanically functioning equipment. Oversee installation, operation, maintenance, and repair of such equipment as centralized heat, gas, water, and steam systems.

### Q. How did you become interested in your particular field?

**A.** I have always been interested in mechanical things. The interest started as a kid playing with legos and continued through later in life with working on cars and school.

### Q. Who or what influenced your decision the most and why?

**A.** My longtime girlfriend, now fiancé, and my parents have been very supportive. They pushed and challenged me to make decisions that would benefit my long term goals.

### Q. What is your educational background?

**A.** Midview High School, Lorain County JVS Manufacturing Engineering Technology Program, Lorain County Community College Associate of Science Welding Technology, and Cleveland State University Bachelors of Science Mechanical Engineering.

### Q. How did you get to where you are today? What path did your employment journey take?

**A.** I focused my education towards my career path since early high school by attending the Tech Prep program at Lorain County JVS. I worked fulltime in manufacturing and attended college fulltime. I have always worked in manufacturing to gain important hands on experience that most engineers lack.

### Q. What skills or certifications do you think are needed to be successful in this field?

**A.** Being a successful engineer takes multiple skills. Besides the typical skills associated with technology, the most important skill is communication. You may have the best idea but if you cannot communicate this to the customer, the idea will never happen. Organization is another key skill. Certifications are always important. It is important to choose the right ones for the field you work in. Since I work in Aerospace I obtained certifications in the aerospace international standard.

### Q. What is the best part of your job?

**A.** The best part of my job is that I get to be versatile. I work for a small company so I have to wear many hats. One day I can be working on a project, the next day I will be working with the quality department or producing parts as an operator.

### Q. Do you have any words of advice for someone considering a career in your field?

**A.** Get involved early in manufacturing. Learn how things work by working with your hands whether it is fixing a car or building something.



## Earnings Potential

Location	Year	Pay Period	Low	Median	High
United States	2009	Yearly	\$49,700	\$77,000	\$117,600
Ohio	2009	Yearly	\$44,600	\$66,400	\$103,000
Cleveland Elyria-Mentor, OH MSA	2009	Yearly	\$44,500	\$68,200	\$102,700

0\*Net Online, <http://online.onetcenter.org>.

Sources: Occupational Information Network, O\*Net Online, <http://online.onetcenter.org>. \*U.S. Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook, <http://stats.bls.gov/oco>