

# What I Can Do With a Major In Engineering

## FOR THE RECORD



**Jack**  
Senior Engineer  
Gredell & Associates  
Wilmington, Del.

### EDUCATION

- ▶ Delcastle Technical High School, New Castle, Del. Graduated 1979. Favorite subjects—math and science. *“I studied technical drafting in high school, which caused me to begin to think about how things go together.”*
- ▶ University of Delaware, Newark. Studied civil engineering 1979-1982. Transferred to technical college.
- ▶ Delaware Technical and Community College, Newark. Associate’s degrees in civil engineering technology and architectural technology 1984.
- ▶ Drexel University, Philadelphia, Pa. Bachelor’s degree in civil engineering 1990. Took night courses while working full time during the day.

### WORK HISTORY

- ▶ Assistant manager, Putt-Putt Golf Co., Ogletown, Del., 1976-1987. Handled maintenance, cash register, and customer sales. Started working part time while in high school.
- ▶ Stockperson, Best/Basco, Newark, Del., 1978-1979. Worked part time at a department store.
- ▶ Junior drafter, Delaware Engineering and Design, Newark, Del., 1979. Cooperative education work experience through school.
- ▶ Stockperson, Rickel Home Center, Newark, Del., 1984-1985.
- ▶ Draftsperson, Archteam, Kimblesville, Pa., 1984. Summer cooperative education job through technical college.
- ▶ Structural designer and drafter, Long & Tann, Inc., Wilmington, Del., 1984-1989. Worked for an engineering consulting firm.

### JOB BENEFITS

- ▶ Favorites—medical insurance and bonuses. *“Health insurance protects my family, and bonuses give me an incentive to perform well.”*
- ▶ Others—life, dental, accident, and optical insurances; paid vacations and holidays; flexible time.

### CLOSE-UP

- ▶ *“Early on I developed an interest in building design. I can remember playing with Lincoln Logs as a child.”*

## Job Categories & Job Titles

### Acoustical

- Acoustical Engineer
  - Architectural
  - Medical
  - Musical
  - Physical
  - Speech & Hearing
  - Structure & Vibration
  - Underwater
- Bioacoustical Engineer
- Noise Control Engineer
- Sound Mixer

### Aeronautical

- Aero Dynamist
- Aeronautical Engineer
- Aerospace Component Engineer
- Aerospace Design Engineer
- Aerospace Research Engineer
- Aerospace Systems Engineer (Flight, Control, Vehicle)
- Aircraft Designer
- Aircraft Stress Analyst
- Aircraft Test Engineer
- Avionics Engineer
- Flight Analyst
- Flight Test Engineer
- NASA Engineer

### Agricultural

- Agricultural Engineer
- Aquacultural Engineer
- Biosystems Engineer
- Forest Engineer
- Machinery Systems Engineer

### Architectural

- Architectural Drafter
- Structural Engineer



### Biomedical

- Bioengineer
- Bioenvironmental Engineer
- Biomedical Engineer
- Clinical Engineer
- Medical Engineer
- Rehabilitation Engineer
- Tissue Engineer

### Chemical

- Biochemical Engineer
- Chemical Engineer
- Chemical Process Engineer (Petroleum & Petrochemical Industries)
- Food Engineer

### Civil

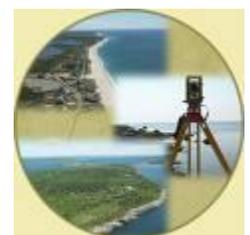
- Civil Drafter
- Civil Engineer
- Construction Engineer
- Engineering Specialist:
  - Bridge
  - Civil
  - Highway
  - Hydraulic
- Geotechnical Engineer
- Highway Engineer
- Irrigation Engineer
- Material Resources Survey Hydrologist
- Materials Engineer
- Packaging Designer
- Photogrammetric Engineer
- Sanitary Engineer
- Structural Engineer
- Traffic Engineer
- Transportation Engineer
- Transportation Planner
- Urban Planner
- Water Resources Control Engineer
- Water Resources Engineer
- Water Systems Civil Engineer

### Electrical & Electronic

- Applications Drafter
- Automatic Control Engineer
- Cable Engineer
- Communication Engineer
- Component Engineer
- Computer Engineer
- Computer Hardware Engineer
- Computer Systems Troubleshooter
- Control Engineer
- Design Engineer
- Digital Engineer
- Distribution Engineer
- Electrical Engineer
- Electronic Engineer
- Electronic Mechanic
- Equipment Engineer
- Illuminating Engineer
- Information Technology (IT) Engineer
- Lighting Engineer
- Power Plant Engineer
- Radio Engineer
- Safety Engineer
- Signal Engineer
- Software Engineer
- Systems Engineer
- Telecommunications Engineer
- Telephone Engineer
- Transmission Engineer

### Environmental

- Air Quality Engineer
- Environmental Engineer
- Ventilating, Air-Conditioning, and Refrigeration Engineer
- Waste Management Engineer
- Waste Water Engineer



## Industrial

- Human Factors Engineer
- Industrial Engineer
- Manufacturing Engineer
- Quality Engineer
- Systems Engineer

## Marine

- Marine Engineer
- Marine Drafter

## Mechanical

- Automotive Engineer
- Design Drafter
- Designer
- Estimator
- Heating Engineer
- HVAC/R (Heating, Ventilation, Air Conditioning & Refrigeration) Engineer
- Mechanical Engineer
- Optical Engineer
- Ordnance Engineer
- Packaging Engineer
- Plant Engineer
- Product Developer
- Production Manager
- Safety Engineer
- Technical Salesperson
- Test Engineer
- Tool Engineer
- Utilization Engineer

## Software

- Software Engineer
- Software Specialist/User Problems

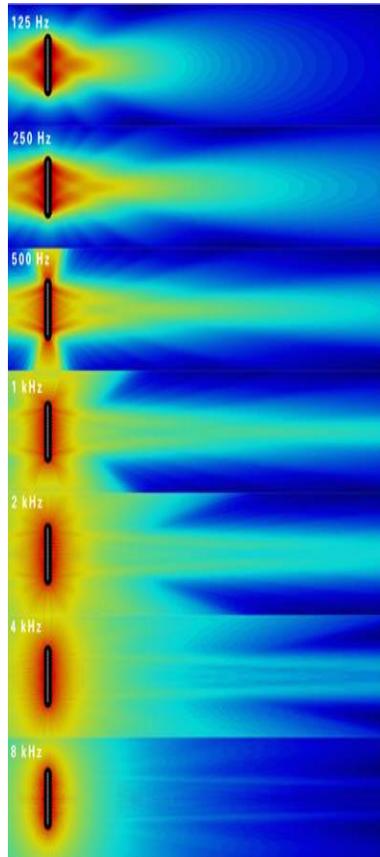
## Technologist

- Drafter
- Engineering Technician
- Engineering Technologist
- Surveyor

## Additional Titles in Engineering

- Automotive Engineer
- Combustion Engineer
- Explosives Engineer
- Fire Protection Engineer
- Geological Engineer
- Geo Technical Engineer

- Manufacturing Engineer
- Mining Engineer
- Naval Engineer
- Nuclear Engineer
- Ocean Engineer
- Petroleum Engineer
- Precision Engineer
- Refrigeration Engineer
- Robotics Engineer
- Roller Coaster Engineer
- Welding Engineer



## Employment Settings

Working conditions in engineering position vary depending on the specific field and department in which one works. Hands-on engineers work in plants and factories. Researchers work mainly in laboratories, research institutes, and universities. Those in management positions work mostly in offices; and teachers, of course, work in school environments. Whatever the job description, an engineering typically works a standard eight-hour day, five days a week.

## Skills & Abilities

**Operation and Control** — Controlling operations of equipment or systems.

**Operation Monitoring** — Watching gauges, dials, or other indicators to make sure a machine is working properly.

**Reading Comprehension** — Understanding written sentences and paragraphs in work related documents.

**Troubleshooting** — Determining causes of operating errors and deciding what to do about it.

**Active Learning** — Understanding the implications of new information for both current and future problem-solving and decision-making.

**Active Listening** — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

**Coordination** — Adjusting actions in relation to others' actions.

**Critical Thinking** — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

**Equipment Selection** — Determining the kind of tools and equipment needed to do a job.

**Social Perceptiveness** — Being aware of others' reactions and understanding why they react as they do.

**Auditory Attention** — The ability to focus on a single source of sound in the presence of other distracting sounds.

**Deductive Reasoning** — The ability to apply general rules to specific problems to produce answers that make sense.

**Hearing Sensitivity** — The ability to detect or tell the differences between sounds that vary in pitch and loudness.

**Oral Comprehension** — The ability to listen to and understand information and ideas presented through spoken words and sentences.

**Selective Attention** — The ability to concentrate on a task over a period of time without being distracted.

**Speech Recognition** — The ability to identify and understand the speech of another person.

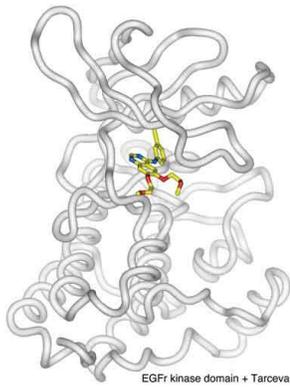
**Speech Clarity** — The ability to speak clearly so others can understand you.

**Control Precision** — The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.

**Flexibility of Closure** — The ability to identify or detect a known pattern (a figure, object, word, or sound) that is hidden in other distracting material.

**Inductive Reasoning** — The ability to combine pieces of information to form general rules or conclusions.





## Career Building Strategies

*Remember:* There are many occupations that do not require a specific undergraduate major; they are often learned as a result of on-the-job training rather than prior education. What is sought among prospective employees is the development of certain skills and abilities that can be developed not only through an academic major but through courses taken as part of one's general education, and through internships, directed studies, tutorials, seminars, study abroad, work-study and summer employment, and volunteer experiences.

- Gain work experience and information about careers through internships.
- Develop your communication skills. Develop the ability to write and speak well.
- Develop the ability to work well in teams as well as alone.
- Accuracy and attention to detail are important traits for the engineering field.
- Use the Mentor Network to speak with professionals in the field.
- Develop analytical, critical-thinking and problem solving skills.
- Develop high ethical standards.
- Certifications may increase job marketability.
- Actively participate in student organizations to develop leadership skills.
- Obtain a part time job in the Engineering field.



*"Engineering is the professional art of applying science to the optimum conversion of natural resources to the benefit of man."*

~Ralph J. Smith

## Internet Sites and Professional Associations

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|---|--|
| Amer. Inst. Of Mining, Metallurgical & Petroleum Eng.<br><a href="http://www.aimeny.org">www.aimeny.org</a> | Audio Engineering Society<br><a href="http://www.aes.org">www.aes.org</a>                        |
| American Institute of Aeronautics & Astronautics<br><a href="http://www.aiaa.org">www.aiaa.org</a>          | Engineer Girl<br><a href="http://www.engineergirl.com">www.engineergirl.com</a>                  |
| American Chemical Society<br><a href="http://www.acs.org">www.acs.org</a>                                   | Inst. of Electrical & Electronics Eng.<br><a href="http://www.ieee.org">www.ieee.org</a>         |
| American Environmental Engineers<br><a href="http://www.enviro-engrs.org/">www.enviro-engrs.org/</a>        | Inst. of Refrig., Heating & A/C Eng.<br><a href="http://www.irhace.org.nz">www.irhace.org.nz</a> |
| American Geological Institute<br><a href="http://www.agiweb.org">www.agiweb.org</a>                         | Institute of Explosives Engineers<br><a href="http://www.iexpe.org">www.iexpe.org</a>            |
| American Society of Civil Engineers<br><a href="http://www.asce.org">www.asce.org</a>                       | International Gas Turbine Institute<br><a href="http://www.asme.org/igt">www.asme.org/igt</a>    |
| American Society of Mechanical Engineers<br><a href="http://www.asme.org">www.asme.org</a>                  | Society of Automotive Engineers<br><a href="http://www.sae.org">www.sae.org</a>                  |
| American Society of Naval Engineers<br><a href="http://www.navalengineers.org">www.navalengineers.org</a>   | Society of Manufacturing Engineers<br><a href="http://www.sme.org">www.sme.org</a>               |
| American Society of Safety Engineers<br><a href="http://www.asse.org">www.asse.org</a>                      | Society of Nuclear Medicine<br><a href="http://www.snm.org">www.snm.org</a>                      |
| Association for Computer Machinery<br><a href="http://www.acm.org">www.acm.org</a>                          | Structural Engineers Association<br><a href="http://www.seaint.org">www.seaint.org</a>           |

## Want to Know More? Check out..

**California Career Cafe:**  
[www.CACareerCafe.com](http://www.CACareerCafe.com)

**California Career Zone:**  
[www.CACareerZone.org](http://www.CACareerZone.org)

**My Next Move:**  
[www.MyNextMove.org](http://www.MyNextMove.org)

Sierra College Career Connections  
[careerconnections@sierracollege.edu](mailto:careerconnections@sierracollege.edu)

Rocklin Campus, Room L-107 (916) 660-7481  
5000 Rocklin Road  
Rocklin, CA 95677

NCC (530) 274-5303  
250 Sierra College Drive  
Grass Valley, CA 95945

# Did You Know?

## **The Akashi-Kaikyo Bridge is the longest cable-suspension bridge in the world.**

The Akashi-Kaikyo Bridge opened on April 5, 1998 between Honshu and Shikoku, Japan. The overall suspended length with side spans totals 12,831 ft. 8 in., or 2.43 miles - 1.4 times as long as the Golden Gate Bridge! It also has the tallest bridge towers in the world at a height of 928 feet.

## **A team of five biomedical engineers in Edinburgh, Scotland created the first working bionic arm in 1993.**

Campbell Aird's right arm was amputated in 1982 after doctors diagnosed muscular cancer. His bionic arm is called the Edinburgh Modular Arm System, and is packed with microchips, position-control circuits, miniature motors, gears, and pulleys. It rotates at the shoulder, bends at the elbow, rotates and twists at the wrist, and can grip using artificial fingers. Campbell wears a cap containing an array of microsensors that pick up the electrical pulses his brain is still sending to his absent arm muscles. These pulses then control each movement of his "new" arm.

## **Did you know the Ferris Wheel is considered an engineering wonder?**

The Ferris Wheel was designed by George W. Ferris in 1893. It was designed to be the landmark of the World's Fair in Chicago in 1893. The wheel is supported by two 140-foot steel towers. The towers are connected by a 45-foot axle, making the axle the largest single piece of forged steel made at that time.

## **Herbert Hoover and Jimmy Carter, both U.S. Presidents, had engineering backgrounds.**

Herbert Hoover, the United States 31st President, studied mining engineering at Stanford University, graduating in 1895. Jimmy Carter, the 39th U.S. President, attended Georgia Tech and the United States Naval Academy, from which he graduated in 1946. Carter served in the Navy for 10 years as an engineer working with nuclear-powered submarines.

## **The Sears Tower in Chicago is the tallest building in the U.S. In 1973, the tallest building in the United States opened its doors.**

At 1,454 feet tall (110 stories), the Sears Tower took three years to build and more than \$150 million. From the Skydeck, on a clear day, you can see four states - Illinois, Indiana, Wisconsin, and Michigan. The building contains enough steel to build 50,000 cars and enough telephone wiring to wrap around the world 1.75 times! And how do they keep the over 16,000 windows clean? There are six roof-mounted window washing machines.

## **There are enough roads in the U.S. to stretch from the earth to the moon 8 times!**

In 1999, the U.S. interstate system had a total length of 46,334 miles. But that's only a small fraction of the total number of roads in the country. Transportation engineers have helped to build almost 4 million miles of road in the United States. That's enough to stretch from the earth to the moon 8 times!

## **If it weren't for the work of U.S. Army Corps of Engineers, the Mississippi River would not flow past New Orleans.**

Recently, the main channel of the Mississippi was attempting to change its course and flow down the Atchafalaya River. This would have left Baton Rouge and New Orleans, both important ports without a navigable connection to the Gulf of Mexico. To prevent this, the Old River Control Structure (ORCS) was built in 1963 to let only 30% of Mississippi River volume into the Atchafalaya basin. Such controls have enormous impacts on the coastal wetlands of Louisiana.