



Engineering

**Career Explorations:**  
**Electrical Engineering**

April 17, 2020



9-12/ Engineering  
Electrical Engineering: [April 17, 2020]

**Objective/Learning Target:**

Students will explore Electrical Engineering as a career.

# Electrical Engineering Career Info

- **Electrical Engineers** design, develop, test, and supervise the manufacture of electrical equipment, such as electric motors, radar and navigation systems, communications systems, or power generation equipment. Electrical engineers also design the electrical systems of automobiles and aircraft.
- Electronics engineers design and develop electronic equipment, including broadcast and communications systems, such as portable music players and Global Positioning System (GPS) devices. Many also work in areas closely related to computer hardware.

# Electrical Engineering Duties

- Design new ways to use electrical power to develop or improve products
- Perform detailed calculations to develop manufacturing, construction, and installation standards and specifications
- Direct the manufacture, installation, and testing of electrical equipment to ensure that products meet specifications and codes
- Investigate complaints from customers or the public, evaluate problems, and recommend solutions
- Work with project managers on production efforts to ensure that projects are completed satisfactorily, on time, and within budget

# Electronics engineers typically do the following

- Design electronic components, software, products, or systems for commercial, industrial, medical, military, or scientific applications
- Analyze customer needs and determine the requirements, capacity, and cost for developing an electrical system plan
- Develop maintenance and testing procedures for electronic components and equipment

# Electronics engineers typically do the following

- Evaluate systems and recommend design modifications or equipment repair
- Inspect electronic equipment, instruments, and systems to make sure they meet safety standards and applicable regulations
- Plan and develop applications and modifications for electronic properties used in parts and systems in order to improve technical performance

# Electrical Engineering Salary and Job outlook

- The median annual wage for electrical engineers was \$96,640 in May 2018. The median wage is the wage at which half the workers in an occupation earned more than that amount and half earned less. The lowest 10 percent earned less than \$61,190, and the highest 10 percent earned more than \$153,240.
- Job growth for electrical and electronics engineers is projected to occur largely in professional, scientific, and technical services firms, as more companies are expected to tap the expertise of engineers for projects involving electronic devices and systems. These engineers also will remain in demand to develop sophisticated consumer electronics.

# Watch The Video:

[What is Electrical Engineering](#)

# What does it take to become an Electrical Engineer

## Step 1

- High school students interested in studying electrical or electronics engineering benefit from taking courses in physics and math, including algebra, trigonometry, and calculus. Courses in drafting are also helpful, because electrical and electronics engineers often are required to prepare technical drawings.
- During high school, students can attend engineering summer camps to see what these and other engineers do. Attending these camps can help students plan their coursework for the remainder of their time in high school. The [Engineering Education Service Center](#) has a directory of engineering summer camps.

# What does it take to become an Electrical Engineer

## Step 2

- In order to enter the occupation, prospective electrical and electronics engineers need a bachelor's degree in electrical engineering, electronics engineering, electrical engineering technology, or a related engineering field. Programs include classroom, laboratory, and field studies. Courses include digital systems design, differential equations, and electrical circuit theory. Programs in electrical engineering, electronics engineering, or electrical engineering technology should be accredited by [ABET](#).
  - A degree from an ABET-accredited engineering program
  - A passing score on the Fundamentals of Engineering (FE) exam

# What does it take to become an Electrical Engineer

## Step 3

- Licensure is not required for entry-level positions as electrical and electronics engineers. A Professional Engineering (PE) license, which allows for higher levels of leadership and independence, can be acquired later in one's career. Licensed engineers are called professional engineers (PEs). A PE can oversee the work of other engineers, sign off on projects, and provide services directly to the public. State licensure generally requires
  - Relevant work experience, typically at least 4 years
  - A passing score on the Professional Engineering (PE) exam

# Electrical Engineering – Important qualities

- **Concentration.** Electrical and electronics engineers design and develop complex electrical systems and electronic components and products. They must keep track of multiple design elements and technical characteristics when performing these tasks.
- **Initiative.** Electrical and electronics engineers must apply their knowledge to new tasks in every project they undertake. In addition, they must engage in continuing education to keep up with changes in technology.

# Electrical Engineering – Important qualities

- ***Interpersonal skills.*** Electrical and electronics engineers must work with others during the manufacturing process to ensure that their plans are implemented correctly. This collaboration includes monitoring technicians and devising remedies to problems as they arise.
- ***Math skills.*** Electrical and electronics engineers must use the principles of calculus and other advanced math in order to analyze, design, and troubleshoot equipment.

# Electrical Engineering – Important qualities

- ***Speaking skills.*** Electrical and electronics engineers work closely with other engineers and technicians. They must be able to explain their designs and reasoning clearly and to relay instructions during product development and production. They also may need to explain complex issues to customers who have little or no technical expertise.
- ***Writing skills.*** Electrical and electronics engineers develop technical publications related to equipment they develop, including maintenance manuals, operation manuals, parts lists, product proposals, and design methods documents.

# Engineering Technology fun facts

You may need to look outside of this presentation to answer some of these questions. [Use the US Bureau of Labor and Statistics to help you answer the questions.](#)

Electrical Engineers work a standard 8 to 5 job like everyone else.

- True
- False

Answer:  
True

Electrical Engineers generally work normal hours, but they can be on call or be required to travel depending on their position and responsibilities.

# The average salary for an Electrical Engineering according to the Bureau of Labor and Statistics is ?

- \$40,000 - \$60,000 annually
- \$60,000 - \$80,000 annually
- \$80,000 - \$100,000 annually
- \$100,000 - \$120,000 annually

**Answer: \$80,000 -  
\$100,000 annually**

According to the Bureau of Labor and  
Statistics the median income for a  
Electrical Engineering in 2018 was  
\$96,640.

An Electrical Engineering will spend \_\_\_\_\_  
years in school or training.

- 1 to 2
- 2 to 3
- 2 to 4
- 4 to 5

# Answer: 4 to 5

An electrical engineering students will spend between 4 and 5 years to earn certifications.

Electrical Engineers work indoors only and do not have to worry about working in the elements?

- True
- False

# Answer: False

An Electrical Engineers could be working in doors one day and outdoors the next depending on their subfield and employer.

You must attend a 4-year college in order to become a Electrical Engineering ?

- True
- False

# Answer: True

Electrical Engineers need a bachelors degree from a school that is accredited by [ABET](#).

# How can I become a Electrical Engineering?

- A degree from an ABET-accredited engineering program
- A passing score on the Fundamentals of Engineering (FE) exam
- Relevant work experience, typically at least 4 years
- All of the above

Answer: All of the above