

Table of Contents

1. [What is an Electrical Engineer?](#)
2. [What does an Electrical Engineer do?](#)
3. [What is the workplace of an Electrical Engineer like?](#)
4. [What is the difference between an electrical engineer and a computer engineer?](#)
5. [Where can an electrical engineer work?](#)
6. [Can an electrical engineer become a good programmer?](#)
7. [What is some good advice for electrical engineering students?](#)

What is an Electrical Engineer?

- An Electrical Engineer is a specialized type of [Engineer](#). Also known as: [Electrical Project Manager Engineer](#), [Electrical Project Engineer](#).
- An electrical engineer is someone who designs and develops new electrical equipment, solves problems and tests equipment. They work with all kinds of electronic devices, from the smallest pocket devices to large supercomputers.
- Electrical engineering deals with electricity, electro-magnetism and electronics. It also covers power, control systems, telecommunications and signal processing.
- These engineers are usually concerned with large-scale electrical systems such as motor control and power transmission, as well as utilizing electricity to transmit energy.
- Electrical engineers may work on a diverse range of technologies, from the design of household appliances, lighting and wiring of buildings, telecommunication systems, electrical power stations and satellite communications.
- They may plan their designs using computer-aided software or they may also sketch ideas by hand.

What does an Electrical Engineer do?

Electrical engineers work on a variety of projects, such as computers, robots, cell phones, cards, radars, navigation systems, wiring and lighting in buildings and other kinds of electrical systems.

Electrical engineers start out a project by defining what a new electronics should be able to do. They will then design the circuits and parts of the electronics using a computer. They will create a prototype and test the product to improve it. Most products do not work initially or have some bugs that need to be fixed. The electrical engineer needs to figure out the problem and make the product work.

There are many sub-disciplines of electrical engineering. Some electrical engineers specialize exclusively in one sub-discipline, while others specialize in a combination of sub-disciplines. The most popular sub-disciplines are:

Electronic Engineer deals with electronic circuits such as resistors, capacitors, inductors, transistors and diodes

Microelectronics Engineer deals with design and micro-fabrication of tiny electronic circuit components

Signal Processing Engineer deals with signals, such as analog or digital signals

Power Engineer deals with electricity and design of related electrical devices such as transformers, generators, motors and power electronics

Control Engineer deals with design of controllers that cause systems to behave in a certain way, using micro-controllers, programmable logic controllers, digital signal processors and electrical circuits

Telecommunications Engineer deals with transmission of information via a cable or optical fiber

Instrumentation Engineer deals with the design of measuring devices for pressure, flow and temperature. This involves a deep understanding of physics

Computer Engineer deals with the design of computers and computer hardware

What is the workplace of an Electrical Engineer like?

- Electrical engineers usually work in a lab, an office, a mine or in industrial plants.
- An electrical engineer usually can pursue a technical career in any industry.
- They usually supervise computer programmers, electricians, scientists and other engineers.
- A typical work week is composed of 40 hours although there might be some overtime to meet deadlines.
- An electrical engineer also spends a lot of time doing project management, such as meeting with clients, determining budgets and preparing project schedules.
- Engineering projects usually require written documentation, so strong writing and communication skills are important.



Cubicles of the Engineering & Management Team



Cubicles of the Engineering & Management Team



Electronics Manufacturing Hall

What is the difference between an electrical engineer and a computer engineer?

- Both electrical engineers and computer engineers are involved in developing and enhancing nearly every aspect of our lives, and are in demand by a wide range of industries.
- Electrical and computer engineering are very close, and are built around the same core subjects.
- Each major represents an area of study, and these areas overlap - there is no finite end of electrical engineering and start of computer engineering, or vice-versa.
- Electrical engineering students have required courses, such as power systems and energy conversion, semiconductor devices and circuits, and electromagnetic fields and waves.
- Computer engineering students have required courses in software systems and software engineering, digital system design, and microprocessor interfacing.

Where can an electrical engineer work?

An electrical engineer can work in a variety of engineering industries: Aerospace, Automotive, Chemical, Construction, Defence, Electronics, Consumer Goods, Marine, Materials & Metals, Oil & Gas, Pharmaceuticals, Power Generation, Rail, Telecoms, and Utilities.

Electrical engineers can work for corporations, non-profit organizations, or government agencies.

They can also become managers, patent attorneys, professors, or work in the financial sector.

Can an electrical engineer become a good programmer?

- Electrical engineers are exposed to computer programming early on, as they need to take introductory programming coursework as part of their electrical engineering curriculum.
- An electrical engineer has the choice of avoiding all but the introductory programming courses if learning how to code is not something that is of interest.
- But some students decide to double major in electrical engineering and computer engineering, as many of the courses are the same.
- If programming is pursued, one of the biggest advantages an electrical engineer has is his/her hardware background, which gives the engineer a clear understanding of what the computer is capable of doing.

What is some good advice for electrical engineering students?

Here are a few obvious but essential pieces of advice to help electrical engineering students make the best of their years in university:

- Go to class and do your homework. If you're not a morning person, try not to load up all of your classes for the first part of the day. It'll be harder for you to get to class, and missing class is just not an option. Not doing your homework is a surefire way to fail; if anything, you should do more problems than what the professor assigns.
- Work with your professors. Use the professor's office hours to get any help you need and to work through any problems you may be having. This will show the professor that you are interested in the class and willing to put in the effort to learn.
- Choose your friends wisely. If your friends or study mates are happy with getting C's and D's, then that's what you will end up thinking is acceptable, and what you'll end up getting as well. The opposite is true, if you hang around with people that aim for A's and B's, then that's what you'll be aiming for and getting.
- Learn how to code. You'll become far more valuable to a future employer. You'll also power through equation-heavy assignments by being able to create some powerful tools to help you crunch numbers.
- Make sure you do an internship. It is safe to say that most employers look for some work experience when hiring a new engineer. It is also a great way to make connections in the industry that may come in handy in the future.

What jobs can you do with an electrical engineering degree?

Graduates with electrical engineering degrees can choose from careers in a wide range of engineering industries. Here's what you could do in each.

Electrical engineering graduates can find jobs in most engineering industries. These include:

- Aerospace industry
- Automotive industry
- Chemical industry
- Construction industry
- Defence industry
- Electronics industry
- Fast moving consumer goods industry
- Marine industry
- Materials and metals industry
- Oil and gas industry
- Pharmaceuticals industry
- Power generation industry
- Rail industry
- Telecoms
- Utilities industry

What precisely would my job as an electrical engineering graduate be?

With some employers, electrical engineering graduates will develop 'generalist' engineering skills, performing similar jobs to graduates who studied different disciplines. However, many others will prefer you to further develop your specialist knowledge as an electrical engineer.

Sectors that often prefer their graduates to become specialists include the following.

- Rolls-Royce states on its website that in the **aerospace industry** electrical engineering graduates can help 'design the complicated interface that transfers electricity from the engine to the aircraft to power its electrical systems. This includes cabin pressurisation in civil aircraft.' It also outlines: '**Marine** electrical engineers design the interface that turns the power from a ship's multiple engines into one controlled power source, which then propels the ship and powers all of its electrical appliances.'
- The **built environment sector** seeks electrical engineers for roles in building services engineering, designing and overseeing the installation of necessities such as power, lighting, fire systems and security systems.
- In the **materials and metals sector**, Dr Andrew Smith, knowledge group leader at Tata Steel, comments that electrical engineers 'can be involved in manufacturing, eg process control, ensuring critical pieces of kit are maintained, improved and developed.'
- Meanwhile at EDF Energy – Generation, asset developer Paul Clarke discusses the **power generation sector**. He comments: 'Electrical engineers focus on maintaining the electrical plant items (switchgear, transformers, motors, cables, generators, HVAC (heating, ventilation and air conditioning), UPS (uninterruptable power supply) and lighting.'
- Network Rail's group asset management director, Jerry England, states that in the **rail engineering sector** 'electrical engineers will be involved with power distribution and energy management systems'.
- Neil Pullen, director of gas transmission asset management at National Grid, describes opportunities in the **utilities industry**. He says: 'Electrical engineers may be involved in electrical design or network design work, for example relating to power systems (eg network analysis of whether a system

is safe and secure to run). Or they might be involved in the day-to-day operating of a site, for example providing first or second line support.'

- Electrical engineers in the **oil and gas industry** design and maintain electrical systems and components, making sure that they meet the right standards of safety and efficiency when used offshore. This can involve making small alterations or large-scale equipment changes.

Industries such as defence and fast moving consumer goods often like graduates to work cross-discipline.

- Commenting on the **defence industry**, Paul Jones, enterprise integration manager at BAE systems, says: 'At BAE systems – and at most other defence companies – engineers today mainly work at system level. A 'system' could be an aircraft or submarine, or one of its major components, or the whole battle space in which it operates, including the associated communications technologies, people, buildings and legal requirements. Defence systems are now so integrated that engineers need to operate cross-discipline, for example using a mixture of mechanical, electronic and electrical engineering knowledge.'
- Chris Traynor, careers adviser and former engineer and engineering recruiter, explains the situation in the **fast moving consumer goods industry**. He comments: 'Almost all the graduate roles are in one of two areas: manufacturing/engineering or supply network operations/logistics. And for both of these areas graduates from different disciplines would be doing similar jobs as each other. The reason for this is that the real "work" is not defined in nice separate buckets of mechanical, electrical, chemical etc, but normally a mixture of different disciplines as a general manufacturing or logistics engineer. Graduates will pick up skills from other disciplines as they go through their training and career.'