



Reading 1

► The following text provides a definition of Electrical Engineering. Is it similar to the one you gave? Does it contain information that you haven't included in your own definition? Read on and check:

Electrical Engineering: the field, the branches, the careers

Electrical engineering is a scientific discipline concerned with the study and practical applications of electricity, electronics and electromagnetism. Electrical and electronics engineers apply the principles of mathematics and science in order to identify and address complex problems, and develop innovative solutions. They work with both large-scale electrical systems (e.g., power generation and transmission systems), and small-scale systems (e.g., computers and mobile devices) that process information. They are in charge of designing, developing and utilizing a diverse range of electrical and electronic devices which benefit and transform society. They also create electrical equipment and electronic components, ranging from integrated circuits, computer chips, and electronic assemblies to household appliances, the electrical systems of vehicles and aircraft, satellite communication systems, telecommunication systems, electrical power stations, and power distribution networks. In addition, they test and supervise the manufacture of electrical and electronic equipment and machinery.

Electrical engineering is subdivided into a wide range of subdisciplines, many of which overlap with one another and also overlap with other engineering branches, such as nanotechnology, electrochemistry, renewable energies, mechatronics, materials science, and many more. Due to its expansion of scope into so many subfields, it is rather difficult to come up with a formula for the classification of the main subdivisions. However, the major branches of electrical engineering could be classified into three broad categories:

a) the branch concerned with electricity and its applications. Specialities within this field include the design and manufacture of lighting systems, appliances, generators, transmission lines, transformers, electric motors, etc. A large number of subdisciplines, such as electromagnetics and power engineering, comprise this category.

b) the branch concerned with the electronic computer, namely the field of computer engineering, which, since its introduction in World War II, has attracted members of a host of disciplines outside electronics, from applied mathematicians to linguists. Subdomains within this category include analog, digital, and mixed-signal circuit design, computer hardware engineering, signal-, image- and speech- processing, control engineering, electronic packaging, microelectronics, embedded systems design, robotics, pattern recognition and artificial intelligence, instrumentation engineering, etc.

c) the branch of communications, which comprises a broad array of topics, such as telephony, satellite communications, telecommunications, as well as the transmission of voice and data through coaxial cables, optical fiber networks, or space.

Electrical engineering is nowadays considered to be one of the largest scientific disciplines, as the use of electrical and electronic equipment has spread into a variety of areas from computer hardware and networks, to information technology, agricultural production, health care, renewable energy resources, and outer space exploration, to name but a few. This, as a result, assures an ongoing demand for electrical engineering graduates for the public sector and private industries, both in the international and the domestic labour market.

