

Course 1 : definition of electrical engineering

1. What Is Electrical Engineering?

Electrical engineering is the field of engineering, concerned with the study, designing, and use of appliances and equipment which use any form of electricity. therefore, it also includes electromagnetism.

electrical engineering was first acknowledged as a profession when commercialization started to gain ground in the 19th century when electricity became widely generated and distributed. previously, electrical engineering was limited to industrial use only, however, after the invention of transistor, the manufacturing cost led the electrical revolution to become part of electric home appliances.

2. What does an electrical engineer do?

Electrical engineers design, develop, test and supervise the manufacturing of electrical equipment, such as electric motors, radar and navigation systems, communications systems and power generation equipment.

Electrical engineers work with electricity in a variety of areas - aircraft and automobiles; broadcasting and communications systems; lighting and wiring in buildings; machinery controls; power generating and transmitting.. They can be involved with the design of new products as well as testing equipment and solving problems.

3. branches of electrical engineering?

One of the characteristics of electricity is that it may be used for both **energy and information transmission**. These were also the first fields to create electrical engineering. Today, electrical engineering is divided into several subfields:

Power and energy

Energy and strength engineering deals with the transmission, and distribution of strength in addition to the layout of a number of associated gadgets. Those include **transformers**,

electric mills, electric motors, and excessive voltage engineering. In lots of regions of the sector, government keep an electrical community known as an energy grid. Users buy electrical power from the grid, heading off the highly-priced exercising of having to generate their own. Electricity engineers may go at the design and upkeep of the power grid in addition to the electricity structures that hook up with it. Such structures are referred to as on-grid power systems and may deliver the grid with extra energy, draw power from the grid, or do each.

Telecommunications

Telecommunications engineering specializes in the **transmission of data** throughout a verbal exchange channel inclusive of a **coax cable, optical fibre** or **free area**. Transmissions throughout unfastened area require facts to be encoded in a carrier signal to shift the records to a provider frequency appropriate for transmission; this is referred to as modulation. Famous analogy modulation techniques include amplitude modulation and frequency modulation.

Once the transmission traits of a device are determined, telecommunication engineers design the transmitters and receivers wanted for such systems. Those are occasionally combined to form a two-manner verbal exchange device is known as a transceiver.

Control engineering (Automatic)

Control engineering is concerned with the **modelling of a wide range of dynamic systems** as well as the creation of controllers that will cause these systems to behave as desired. Electronic circuits, digital signal processors, microcontrollers, and programmable logic controllers may be used to implement such controllers by electronics control engineers. Control engineering has a wide range of applications, from commercial aero plane flight and propulsion systems to cruise control in many modern autos. It also has a significant impact on industrial automation.

When designing control systems, control engineers frequently employ feedback. In a car with cruise control, for example, the vehicle's speed is constantly monitored and sent back to the system, which changes the motor's power output accordingly.

Electronics

Digital engineering involves the layout and checking out of electronic circuits that use the houses of components which includes **resistors, capacitors, inductors, diodes, and**

transistors to acquire a particular capability. The tuned circuit, which allows the person of a radio to clear out all but a single station, is simply one example of one of this circuit.