Board of Engineers, Cambodia

Definition and scope of each category of branches Engineering for BEC registration

Civil engineering

Civil engineering comprises the design, construction and maintenance of the physical and natural built environments.

The Civil engineering is composed of subdisciplines: Building engineering, Roads and Bridges engineering, Urban Planning engineering, Transportation engineering, Rural Development engineering, Geotechnical engineering, Mining engineering, Hydraulic engineering, Railway engineering, Water Resources engineering and Environmental engineering.

1	**Building engineering**: Is a subdiscipline that deals with the technological aspects and multi-disciplinary approach to the planning, design, construction and operation of buildings.
2	**Roads and Bridges engineering**: Is a subdiscipline involving with the planning, design, construction, operation, and maintenance of roads, bridges, and tunnels to ensure safe and effective transportation of people and goods.
3	**Urban Planning engineering**: Is a subdiscipline that deals with the municipal issues such as designing, constructing, and maintaining streets, sidewalks, public parks, and cycling infrastructure, transportation, water supply networks, sewers, street lighting, municipal solid waste management and disposal.
4	**Transportation engineering**: Is a subdiscipline that applied to the application of technological and scientific principles to the planning, functional design, operation and management of facilities for any modes of transportation to provide safe, efficient movement of people and goods.
5	**Geotechnical engineering:** Is a subdiscipline concerning with the soil investigation at the site of a civil engineering project. It involves in foundation engineering, which focuses on substructure design.
6	**Rural Development engineering**: Is a subdiscipline concerning with the process of improving the quality of infrastructure in rural areas.
7	**Mining engineering**: Is a subdiscipline involving with the science, technology and practice of extracting and processing minerals from a naturally occurring environment.
8	**Hydraulic engineering**: Is a subdiscipline concerning with the flow and conveyance of fluids, irrigation, water supply, drainage facilities (including bridges, dams, spillways, channels, culverts, storm sewers and canals).

9	**Railway engineering**: Is a subdiscipline concerning with the design, construction and operation of all types of railway systems.
10	**Water Resources engineering:** Is a subdiscipline concerning with the forecasting, planning, developing and managing of water resources.
11	**Environmental engineering**: Is a subdiscipline concerning with the application of engineering to improve and protect the environment.

Mechanical engineering

Mechanical engineering comprises the design and analysis of heat and mechanical power for the operation of machines and mechanical systems.

The mechanical engineering is composed of subdisciplines: Automotive engineering, Marine engineering, Manufacturing engineering, Mechanical engineering, Thermal engineering, and Nuclear engineering.

1	**Automotive engineering**: Is a subdiscipline concerning with the design, manufacture and operation of the systems and equipment that propel and control vehicles, including motorcycles, automobiles, buses, trucks, etc.
2	**Marine engineering**: Is a subdiscipline relating to the operation of the systems and equipment that propel and control vehicles, including boats, ships, oilrigs and other marine vessels or structures, oceanographic engineering.
3	**Manufacturing engineering:** Is a subdiscipline concerning with different manufacturing practices, research and development of systems for processing machines, tools and equipment.
4	**Mechanical engineering:** Is a subdiscipline concerning with the application of physics, mathematics engineering , materials and science principles to design, analyze, manufacture, and maintain mechanical systems.
5	**Thermal engineering:** Is a subdiscipline concerning with heating or cooling of processes, equipment, or enclosed environments. It relates to the air conditioning, refrigeration, heating and ventilating.
6	**Nuclear engineering:** Is a subdiscipline concerning with the application of breaking down atomic nuclei (fission) or of combining atomic nuclei (fusion), or with the application of other sub-atomic processes based on the principles of nuclear physics.

Electrical engineering

The electrical engineering comprises the study and application of electricity, electronics and electromagnetism.

The electrical engineering is composed of subdisciplines: Power engineering, Electronics engineering, Telecommunication engineering, Electrical engineering, Micro-electronics engineering and Computer engineering.

1	**Power engineering**: Is a subdiscipline concerning with the generation, transmission and distribution of electricity and the design of devices such as transformers, electric motors, high-voltage engineering and power electronics.

2	**Electronics engineering**: Is a subdiscipline relating to the creation of physical devices and abstract methods that make it possible to conduct electricity, magnetism and light.
3	**Telecommunication engineering**: Is a subdiscipline focusing on the transmission and processing of information through communication channels that are created by making use of applied electromagnetism that are divided in wired and wireless.
4	**Electrical engineering:** Is a subdiscipline concerning with the study, design and application of equipment, devices and systems which use electricity, electronics, and electromagnetics.
5	**Micro-electronics engineering:** Is a subdiscipline concerning with the study and manufacture (or micro fabrication) of very small electronic designs and components. Usually, but not always, this means micrometer-scale or smaller.
6	**Computer engineering**: Is a subdiscipline concerning with the design and control of computing devices with the application of electrical systems, including software, hardware and network engineering.
	Chemical engineering Chemical engineering is the application of chemical, physical and biological sciences to convert raw materials or chemical substances into more useful or valuable forms. The Chemical engineering is composed of subdisciplines: Biochemical engineering, Food-chemistry, Industry-chemistry, Petroleum engineering.
1	**Biochemical engineering**: Is a subdiscipline dealing with the design, formation and advancement of unit processes which involve with biological organisms or organic molecules. It has various applications such as biofuels, foods, pharmaceuticals, biotechnology, and water treatment processes.
2	**Food-chemistry**: Is a subdiscipline concerning with food processing, packaging, ingredient manufacturing, instrumentation and control.
3	**Industrial-chemistry:** Is a subdiscipline concerning with the application of the physical and chemical processes towards the transformation of raw materials into industrial products.
4	**Petroleum engineering**: Is a subdiscipline concerning with the activities of searching and producing of hydrocarbons, which can be either crude oil or natural gas.
	Interdisciplinary Beside the four above mentioned disciplines, Agro-Industrial engineering, Agricultural engineering, Forestry engineering are considered to be interdisciplinary.
1	**Agro-Industrial engineering:** Is a subdiscipline relating to the preservation and process of bio-base raw materials, with the application of food and non-food industry to maintain the sustainability and harmonization with the environment.

2	**Agricultural engineering**: Is a subdiscipline concerning with the growth and processing of agricultural products.
3	**Forestry Engineering**: Is a subdiscipline concerning with the science and craft of creating, managing, using, conserving and reforesting, and associated resources for human and environment.

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Secretary General

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