Lecture 1

What is Civil Engineering

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Presentation Overview

Civil Engineering

Civil engineering is the oldest branch of engineering that deals with providing people with a livable built environment

It deals with people's everyday needs such as:

- food and water
- livable shelter
- ways to travel
- safety from disaster

Each basic need has a related to at least one civil engineering technical area.

Structural Engineering

Structural engineering is the technical specialty that deals with analysis and design of structures.

Structural design aims at providing a structure with sufficient level of resistance against these loads with minimum cost

Technical Sub-areas

It has several technical sub-areas, named according to the type of structure or to the type of load it carries.

- Earthquake Engineering
- Wind Engineering
- Structural Reliability
- Fire Engineering
- Bridge Engineering
- Dam Engineering
- Building Engineering
- Forensic Engineering

Geotechnical Engineering

Geotechnical engineering is the technical specialty that deals with soil and rock as supporting materials for structures

It deals with the various foundation types that work between the structure and the ground.

It also deals with the stability of soil and rocks.

Technical Sub-areas

Technical areas of study pertinent to geotechnical engineering includes:

- Engineering Geology
- Soil Mechanics
- Rock Mechanics
- Foundation Engineering
- Soil Improvement
- Tunnel Engineering

Water Resources Engineering

Water resource engineering is the specialty that deals with use of water in different human needs.

It includes finding and preservation of water sources, its means of delivery to a city or region, as well as studying its movement, and its erosive effects.

Technical Sub-areas

Its core and related areas of study include:

- Water Resources System Engineering
- Hydraulic Engineering
- Coastal Engineering
- Ocean Engineering

Transportation Engineering

Transportation engineering deals with the efficient transport of people and goods.

Involved in the design of roads, harbors, and airport, as well as railways and traffic control.

Technical Sub-areas

Technical specialties include:

- Transportation Planning
- Transportation System Engineering
- Highway Engineering
- Railway Engineering
- Port and Harbor Engineering
- Airport Engineering
- Traffic Engineering

Construction Engineering

Construction engineering deals with the execution of the plan designed on paper into physical reality.

It involves management of different resources required in the construction process.

Technical Sub-areas

Engineering and management aspects include:

- Construction Methods
- Electric and Mechanical Facilities
- Construction Machineries
- Financial and Cost management
- Contracts and Specifications
- Health and Safety Issues
- Legal Issues and Risk Management

Geomatics Engineering

A technical specialty that deals the measurement and assembly of spatial data of any object in the earth.

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Environmental Engineering

Environmental engineering involves the application engineering to protect human health and preserve the natural environment.

It relies on the knowledge of fundamental sciences of chemistry, biology, ecology, and health.

Technical Sub-areas

Technical areas of study include:

- Water Treatment and Supply
- Wastewater Treatment and Disposal
- Solid Waste Disposal

Citing References

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References

John Smith (2022)
Publication title
Journal Name 12(3), 45 – 678.

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