

BCE-402	Engineering Geology	2L:0T:0P	2 credits
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Pre-requisite: No Pre-requisite.

Course Objectives:

CO1	To focus on the core activities of engineering geologists.
CO2	To understand the engineering properties of rock and unconsolidated materials.
CO3	Characterization and geologic hazard identification and mitigation
CO4	Characterization of geologic sites, rocks and minerals for civil work projects.

Module 1:

Introduction-Branches of geology useful to civil engineering, scope of geological studies in various civil engineering projects. Mineralogy-Mineral, Origin and composition. Physical properties of minerals, susceptibility of minerals to alteration, basic of optical mineralogy. Rock forming minerals, macroscopic identification of common primary & secondary minerals.

Module 2:

Petrology-Rock forming processes. Their origin, structure, Texture and classification of igneous, sedimentary and metamorphic rocks and their suitability as engg. materials.

Stratification, Lamination bedding. Outcrop-its relation to topography, dip and strike of bed, overlap, outlier and inlier.

Rock deformation:Folds, Faults, joints unconformity and their classification, causes and relation to engg. Behaviour of rock masses.

Module 3:

Earthquake, its causes, classification, seismic zones of India and Geological consideration for construction of building, projects in seismic areas.

Landslides, its causes, classification and preventive measures.

Underground water, Origin, Aquifer, Aquicludes, Artesian Wells, underground provinces of India and its role as geological hazard.

Module 4:

Building Stones Engg, Properties of rocks, Alkali aggregate reaction, Grouting, Pozzolonaic materials.

Geological investigations for site selection of Dams and reservoirs tunnels, bridges and Highways. Principles of Geophysical explorations methods for subsurface structures.

Course Outcomes: After the completion of this course the students will be able to:

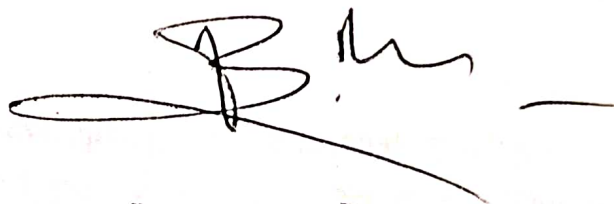
CO1	Understand site characterization and how to collect, analyze, and report geologic data using standards in engineering practice.
CO2	Understand the fundamentals of the engineering properties of Earth materials.
CO3	Understand the geologic hazard and adopt preventive measures.
CO4	Understand the mechanics of soil and consider the appropriate material to prevent problems like settlement and liquefaction.

Text/Reference Books:

1. Engineering and General Geology, Parbin Singh, 8th Edition (2010), S K Kataria & Sons.
2. Text Book of Engineering Geology, N. Chenna Kesavulu, 2nd Edition (2009), Macmillan Publishers India.
3. Prabin Singh : Engg. and General Geology, Katson Publishing House.
4. Blyth F.G.M. : A Geology for Engineers, Arnold, London.
5. D.S. Arora : Geology for Engineers, Mohindra Capital Publishers, Chandigarh.
6. F G Bell : Fundamentals of Engineering Geology , B S Publication



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