

23BS1401: Engineering Geology SYLLABUS

Course Code	23BS1401	Year	II	Semester	II
Course Category	Basic Science	Branch	CIVIL	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	-
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks:	100

Course Objectives:

The objective of this course is to:

1. To know the importance of Engineering Geology to the Civil Engineering.
2. To enable the students, understand what minerals and rocks are and their formation and identification.
3. To highlight significance/ importance/ role of Engineering Geology in construction of Civil Engineering structures.
4. To enable the student, realize its importance and applications of Engineering Geology in Civil Engineering constructions.
5. concepts of Groundwater and its geophysical methods.

Course Outcomes:

Course will enable the student to:

CO	Statement	Blooms level
CO 1	Understand the significance of geological agents on earth surface and its significance in Civil Engineering.	L2
CO 2	Identify and understand the properties of minerals and rocks.	L3
CO 3	Understand the concepts of Groundwater and its geophysical methods.	L2
CO 4	Classify and measure the Earthquake prone areas, Landslides and subsidence to practice the hazard zonation.	L3
CO 5	Investigate the project site for mega/mini civil engineering projects and site selection for mega engineering projects like Dams, Reservoirs and Tunnels.	L4

Course Articulation Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	1	2	-
CO2	2	1	-	-	-	-	-	-	-	-	-	-	1	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	1	-
CO4	3	3	3	2	3	-	2	-	-	-	2	2	2	2
CO5	3	3	2	2	3	-	2	-	-	-	2	2	2	2

Syllabus

Unit No	Content	Mapped COs
I	Introduction: Branches of Geology, Importance of Geology in Civil Engineering with case studies, Weathering of rocks, Geological agents, Weathering process of rock, rivers and geological work of rivers.	CO1
II	Mineralogy And Petrology: Definitions of mineral and rock-Different methods of study of mineral and rock. Physical properties of minerals and rocks for megascopic study for the following minerals and rocks. Common rock forming minerals: Feldspar, Quartz Group, Olivine, Augite, Hornblende, Mica Group, Asbestos, Talc, Chlorite, Kyanite, Garnet, Calcite and ore forming minerals are Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Chromite, Magnetite and Bauxite. Classification, structures, textures and forms of Igneous rocks, Sedimentary rocks, Metamorphic rocks, and their megascopic study of granite varieties, (pink, gray, green). Pegmatite, Dolerite, Basalt etc., Shale, Sand Stone, Lime Stone, Laterite, Quartzite, Gneiss, Schist, Marble, Khondalite and Slate.	CO2
III	Structural Geology: Strike, Dip and Outcrop study of common geological structures associating with the rocks such as Folds, Faults, Joints and Unconformities- parts, types, mechanism and their importance in Civil Engineering.	CO2
IV	Ground Water: Water table, Cone of depression, Geological controls of Ground Water Movement, Ground Water Exploration Techniques. Earthquakes and Land Slides: Terminology, Classification, causes and effects, Shield areas and Seismic bells, Richter scale intensity, Precautions of building constructions in seismic areas. Classification of Landslides, Causes and Effects, measures to be taken prevent their occurrence at Landslides. Geophysics: Importance of Geophysical methods, Classification, Principles of Geophysical study by Gravity method, Magnetic method, Electrical methods, Seismic methods, Radiometric method and Electrical resistivity, Seismic refraction methods and Engineering properties of rocks.	CO3, CO4
V	Geology of Dams, Reservoirs and Tunnels: Types and purpose of Dams, Geological considerations in the selection of a Dam site. Geology consideration for successful constructions of reservoirs, Life of Reservoirs. Purpose of Tunnelling, effects, Lining of Tunnels. Influence of Geology for successful Tunnelling.	CO5

Learning Resource(s)
Text Book(s)
<ol style="list-style-type: none">1. Engineering Geology by N. ChennaKesavulu, Laxmi Publications. 2ndEdn 2014.2. Engineering & General Geology by Parbin Singh Katson educational series 8th 2023
Reference Book(s)
<ol style="list-style-type: none">1. Engineering Geology by SubinoyGangopadhy Oxford University press 1st edition, 2012.2. Engineering Geology by D. Venkat Reddy, Vikas Publishing, 2ndEdn, 2017,3. Geology for Engineers and Environmental Society' Alan E Kehew, 3rd edn., 2013) Pearson publications.4. 'Environmental Geology' (2013) K.S.Valdiya, 2nd ed., McGraw Hill Publications.
Web Materials:
<ol style="list-style-type: none">1. http://nptel.iitm.ac.in/video.php?subjectId=1051051062. http://nptel.iitm.ac.in/video.php?courseId=1055&p=13. http://nptel.iitm.ac.in/video.php?courseId=1055&p=34. http://nptel.iitm.ac.in/video.php?courseId=1055&p=4