

23CE22T1 ENGINEERING GEOLOGY

Course Category	Professional Core	Credits	3
Course Type	Theory	Lecture – Tutorial –Practical	3-0-0
Prerequisite	-	Sessional Evaluation	30
		Semester End Exam. Evaluation	70
		Total Marks	100

Course Objectives	<ol style="list-style-type: none"> 1. To know the importance of engineering geology to the civil engineering. 2. To know different types of mineral and rocks and their formation. 3. To know the significance of structural geology in construction of civil engineering structures. 4. To know the occurrence of ground water and different types of geophysical methods. 5. To know the occurrence of earthquakes and landslides and importance of geology in construction of dams, reservoirs and tunnels. 		
Course Outcomes	COs	Statements	Blooms Level
	CO1	Understand the significance of geological agents on Earth surface and its significance in civil engineering.	L2
	CO2	Identify and understand the properties of Minerals and Rocks.	L3
	CO3	Understand the basics of structural geology and its importance in civil engineering	L2
	CO4	Understand ground water occurrence, exploration and exploitation. Understand various geophysical methods and their application in geology/civil engineering.	L3
	CO5	Classify earthquake and landslides and their occurrence and prevention. Investigate the geological parameters of site for the constructions of dams, reservoirs and tunnels	L3
Course Content	<p style="text-align: center;">UNIT I</p> <p>Introduction: Branches of Geology, Importance of Geology in Civil Engineering with case studies, weathering of rocks, Geological agents, Rivers.</p> <p style="text-align: center;">UNIT II</p> <p>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; Common rock forming minerals - Feldspar, Quartz Group, Olivine, Augite, Hornblende, Mica Group, Asbestos, Talc, Chlorite, Kyanite, Garnet, Calcite; Ore forming minerals - Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Chromite, Magnetite and Bauxite; Classification; structures, textures and forms of Igneous rocks,</p>		

Sedimentary rocks, Metamorphic rocks; 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.

UNIT III

Structural Geology: Strike; Dip; Outcrop study of common geological structures associating with the rocks such as Folds, Faults, Joints; Unconformities - parts, types, mechanism, importance in Civil Engineering.

UNIT IV

Ground Water: Water table; Cone of depression; Geological controls of Ground Water Movement; Ground Water Exploration Techniques.

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.

UNIT 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; Tunnels - Purpose of Tunneling, effects, Lining of Tunnels; Influence of Geology for successful Tunneling.

Earthquakes and Land Slides: Terminology; Classification; causes and effects; Shield areas and Seismic belts; Richter scale intensity; Precautions of building constructions in seismic areas; Classification of Landslides, Causes and Effects; Measures to be taken to prevent the occurrence of landslides.

<p>Textbooks and Reference books</p>	<p>Textbooks:</p> <ol style="list-style-type: none"> 1. N. Chenna Kesavulu, “<i>Engineering Geology</i>”, Laxmi Publications. 2nd edition, 2014. 2. Parbin Singh Katson, “<i>Engineering & General Geology</i>” by educational series, 8th edition, 2023. <p>Reference Books:</p> <ol style="list-style-type: none"> 1. Subinoy Gangopadhyay, “<i>Engineering Geology</i>” Oxford University press 1st edition, 2012. 2. D. Venkat Reddy, “<i>Engineering Geology</i>” Vikas Publishing, 2nd edition, 2017. 3. Alan E Kehew, “<i>Geology for Engineers and Environmental Society</i>”, Pearson Publications, 3rd edition, 2013. 4. K.S.Valdiya, “<i>Environmental Geology</i>”, McGraw Hill Publications, 2nd edition, 2013.
<p>E-resources</p>	<p>https://archive.nptel.ac.in/courses/105/105/105105106</p>

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	1	2	-	-	-	-	-	-	-	-	1	-	-	-	-
CO 2	-	-	-	-	-	-	1	-	1	-	-	-	-	-	1
CO 3	2	-	1	2	-	-	-	-	-	2	-	-	-	-	1
CO 4	-	2	1	1	1	1	-	1	-	1	1	1	-	1	1
CO 5	-	-	-	2	-	2	1	1	2	2	1	1	-	1	-