
	SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY COURSE PLAN (THEORY)	
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ACADEMIC YEAR: 2018-2019

Subject Code	CE8392	L	P	T	C
Subject Title	ENGINEERING GEOLOGY	3	0	0	3
Year / Dept / Sem	II / CIVIL / III	Regulation Year	2017		
Faculty Name / Desg / Dept	Mr.R.MANIKANDAN.M.E./ Assistant Professor / CIVIL				
Course Prerequisite	1. The students should know about the basic concepts of science and earth. 2. The students must have knowledge about the fundamentals of geology.				

ENGINEERING GEOLOGY

OBJECTIVES:

At the end of this course the students will be able to understand the importance of geological knowledge such as earth, earthquake, volcanism and to apply this knowledge in projects such as dams, tunnels, bridges, roads, airport and harbor as well as to choose types of foundations.

UNIT 1 PHYSICAL GEOLOGY 9

Geology in civil engineering – branches of geology – structure of earth and its composition – weathering of rocks – scale of weathering – soils - landforms and processes associated with river, wind, groundwater and sea – relevance to civil engineering. Plate tectonics – Earth quakes – Seismic zones in India.

UNIT II MINEROLOGY 9

Physical properties of minerals – Quartz group, Feldspar group, Pyroxene - hypersthene and augite, Amphibole – hornblende, Mica – muscovite and biotite, Calcite, Gypsum and Clay minerals.

UNIT III PETROLOGY 9

Classification of rocks, distinction between Igneous, Sedimentary and Metamorphic rocks. Engineering properties of rocks. Description, occurrence, engineering properties, distribution and uses of Granite, Dolerite, Basalt, Sandstone, Limestone, Laterite, Shale, Quartzite, Marble, Slate, Gneiss and Schist.

UNIT IV STRUCTURAL GEOLOGY AND GEOPHYSICAL METHODS 9

Geological maps – attitude of beds, study of structures – folds, faults and joints – relevance to civil engineering. Geophysical methods – Seismic and electrical methods for subsurface investigations.

UNIT V APPLICATION OF GEOLOGICAL INVESTIGATIONS**9**

Remote sensing for civil engineering applications; Geological conditions necessary for design and construction of Dams, Reservoirs, Tunnels, and Road cuttings - Hydrogeological investigations and mining - Coastal protection structures. Investigation of Landslides, causes and mitigation.

TOTAL: 45 PERIODS**TEXT BOOKS:**

1. Varghese, P.C., Engineering Geology for Civil Engineering Prentice Hall of India Learning Private Limited, New Delhi, 2012.
2. Venkat Reddy. D. Engineering Geology, Vikas Publishing House Pvt. Lt, 2010.
3. Gokhale KVGK, "Principles of Engineering Geology", B.S. Publications, Hyderabad 2011.
4. Chenna Kesavulu N. "Textbook of Engineering Geology", Macmillan India Ltd., 2009.
5. Parbin Singh. A "Text book of Engineering and General Geology", Katson publishing house, Ludhiana 2009.

REFERENCES:

1. Muthiayya, V.D. "A Text of Geology", Oxford IBH Publications, Calcutta, 1969
2. Blyth F.G.H. and de Freitas M.H., Geology for Engineers, Edward Arnold, London, 2010.
3. Bell .F.G.. "Fundamentals of Engineering Geology", B.S. Publications. Hyderabad 2011.
4. Dobrin, M.B "An introduction to geophysical prospecting", McGraw Hill, New Delhi, 1988.

Course Objectives (CO)	<p>CO1: To introduce the need for prestressing as well as the methods, types and advantages of prestressing to the students.</p> <p>CO2: Students will be introduced to the design of prestressed concrete structures subjected to flexure.</p> <p>CO3: Students will be introduced to the design of prestressed concrete structures subjected to shear.</p> <p>CO4: Calculate prestress losses for simple prestressed concrete girders.</p> <p>CO5: Design prestressed concrete girders for flexure using current design procedures</p> <p>CO6 : Construct moment-curvature and load-deflection curves for a prestressed concrete beam</p>
Expected Course Outcomes (ECO)	<p>At the end of the course, the students should be able to:</p> <p>ECO1: Student shall have knowledge on methods of prestressing</p> <p>ECO2: Able to design various prestressed concrete structural elements.</p>

Mapping of CO & PO(Specify the PO's) - (Fill the col.s with the legend given below)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	-	-	2	-	-	-	-	-	-	-	3	-
C02	-	-	-	-	-	2	-	-	-	-	3	-
C03	2	3	3	-	-	-	3	-	-	-	-	-
C04	-	-	-	-	-	-	3	3	-	-	2	-
C05	3	3	2	-	3	-	2	3	-	3	-	3
C06	3	3	3	-	3	-	-	-	-	-	-	-
Bridging the Curriculum Gap (Additional Topics beyond syllabus/Seminars/Assignments)	BCG1: Crystal formation of rocks BCG2: Engineering properties of rocks BCG3: Presence of minerals in rocks											
Related Website URLs	W1: http://www.journals.elsevier.com/engineering-geology/ W2: www.nptel.ac.in/courses/105108077/											
Related Video Course Materials (min. 3 no.s)	V1: https://www.study.com/academy/lesson/what-is-groundwater-system-definition . V2: https://www.study.com/academy/lesson/what-is-geology.html V3: https://nptelvideos.com/civlengineering/engineering-geology											

S.No	Topic Name	Book – P. No	Teaching Aids	No of hrs	Cumulative hrs
UNIT 1 PHYSICAL GEOLOGY					
Geology in civil engineering – branches of geology – structure of earth and its composition – weathering of rocks – scale of weathering – soils - landforms and processes associated with river, wind, groundwater and sea – relevance to civil engineering. Plate tectonics – Earth quakes – Seismic zones in India.					
1.	Geology in civil engineering	Own notes	Class room teaching&discussion	1	1
2.	Branches of geology	T5	Xerox	1	2
3.	Structure of earth and its composition	T5 (5-10)	Class room teaching	1	3
4.	Weathering of rocks – scale of weathering	T5 (38-46)	Class room teaching with ppt	2	5
5.	Soils - landforms and processes associated with river, wind,	T5 (47-92)	Class room teaching with ppt	3	8

	groundwater and sea – relevance to civil engineering				
6.	Plate tectonics – Earth quakes – Seismic zones in India.	T5 (456-479)	Class room teaching with ppt & seminar	1	9
UNIT II MINEROLOGY					
Physical properties of minerals – Quartz group, Feldspar group, Pyroxene - hypersthene and augite, Amphibole – hornblende, Mica – muscovite and biotite, Calcite, Gypsum and Clay minerals.					
1.	Physical properties of minerals	T5 (196-212)	Class room teaching with ppt	2	11
2.	Crystallography	T5 (213-237)	Class room teaching with ppt	1	12
3.	Quartz group, Feldspar group, Pyroxene - hypersthene and augite, Amphibole – hornblende, Mica – muscovite and biotite, Calcite, Gypsum and Clay minerals.	T5	Class room teaching with ppt and assignments	6	18
UNIT III PETROLOGY					
Classification of rocks, distinction between Igneous, Sedimentary and Metamorphic rocks. Engineering properties of rocks. Description, occurrence, engineering properties, distribution and uses of Granite, Dolerite, Basalt, Sandstone, Limestone, Laterite, Shale, Quartzite, Marble, Slate, Gneiss and Schist.					
1.	Classification of rocks	T5 (260-262,290-293,313-314)	Class room teaching with ppt and assignments	2	20
2.	Engineering properties of rocks	T5 (261-288)	Class room teaching	2	22
3.	Sedimentary rocks	T5 (290-312)	Class room teaching	2	24
4.	Metamorphic rocks.	T5 (313-331)	Class room teaching	2	26
5.	Occurrence and engineering properties of rocks	T5(260-329)	Tutorial	1	27
UNIT IV STRUCTURAL GEOLOGY AND GEOPHYSICAL METHODS					
Geological maps – attitude of beds, study of structures – folds, faults and joints – relevance to civil engineering. Geophysical methods – Seismic and electrical methods for subsurface investigations					
1.	Geological maps –study of structures	T5 (109-110)	Class room teaching	1	28

2.	Folds and it types	T5(115-130)	Class room teaching	2	30
3.	Fault and it types	T5(133-164)	Class room teaching	2	32
4.	Joint and it types	T5(152-158)	Class room teaching	1	33
5.	Geophysical methods-Seismic and electrical methods	T5(510-521)	Class room teaching	3	36
<p>UNIT V APPLICATION OF GEOLOGICAL INVESTIGATIONS Remote sensing for civil engineering applications; Geological conditions necessary for design and construction of Dams, Reservoirs, Tunnels, and Road cuttings - Hydrogeological investigations and mining - Coastal protection structures. Investigation of Landslides, causes and mitigation.</p>					
1.	Remote sensing for civil engineering applications	Xerox	Class room teaching with ppt	1	37
2.	Geological conditions necessary for design and construction of Dams, Reservoirs	T5 (525-540)	Class room teaching with ppt	2	39
3.	Tunnels, and Road cuttings	T5 (541-560)	Class room teaching with ppt	2	41
4.	Hydrogeological investigations and mining - Coastal protection structures	T5 (184-186,165-170)	Class room teaching with ppt	1	42
5.	Investigation of Landslides	T5 (480-496)	Class room teaching with ppt	2	44
6.	Geological considerations	T5	Tutorial	1	45

	<i>Prepared by</i>	<i>Approved by</i>
Signature		
Name	Mr.R.Manikandan	Mr.P.Suresh kumar
Designation	Assistant Professor / CIVIL	Professor&HOD (CIVIL)
Signed date		

LEGEND:

METHODOLOGY TO MAP OBJECTIVE WITH OUTCOME

Course outcomes are achieved through

- a. Suitable Analogies.
- b. Class room teaching.
- c. Assignments.
- d. Tutorials
- e. Weekly, monthly and model exams.
- f. Brain storming.
- g. Group discussion and role play.
- h. Seminars