20CE3451-GEOTECHNICAL ENGINEERING LAB

Offering Branches	CE		
Course Category:	Professional Core	Credits:	1.5
Course Type:	Laboratory	Lecture-Tutorial-Practical:	0-0-3
Prerequisites:	Nil	Continuous Evaluation:	15
		Semester End Evaluation:	35
		Total Marks:	50

Course Outcomes

Upon successful completion of the course, the student will be able to:

CO1	**Determine** the index properties of soil.	K3
CO2	**Determine** in-situ density and compaction characteristics of soil.	K3
CO3	**Evaluate** the compressibility and permeability of the soil.	K3
CO4	**Evaluate** the shear strength of soil.	K4

Contribution of Course Outcomes towards achievement of Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3		2	2	2	2	2		2	3	2
CO2	3	3	3	3		2	2	2	2	2		2	3	2
CO3	3	3	3	3		2	2	2	2	2		2	3	2
CO4	3	3	3	3		3	3	3	3	3		3	3	3
Avg.	3	3	3	3		2	2	2	2	2		2	3	2

1- Low **2-Medium** **3-High**

Course Content

Experiment No.1	**Determine Atterberg's limits** Liquid Limit Test Plastic Limit Test Shrinkage Limit Test	**CO1** CO2 CO3 CO4
Experiment No.2	**Investigate dry density of soil** Core cutter method Sand Replacement method	
Experiment No.3	**Conduct grain size analysis of coarse grade and fine grade soils** Dry Sieve Analysis Wet Sieve Analysis Hydrometer Analysis	
Experiment No.4	**Determine coefficient of permeability** Constant Head Test Falling Head Test	
Experiment No.5	**Measure compaction characteristics of soil** Standard Proctor Test	
Experiment No.6	**Determine engineering properties of consolidation** Consolidation Test	
Experiment No.7	**Determine shear strength of soil** Unconsolidated undrained triaxial test on saturated clay(UU) Laboratory demostration on CD and CU test **Strength-Index test** Unconfined compression test	
Experiment No.8	**Determine shear strength of soil** CD-Direct shear test on Clay CD-Direct shear test on Sand	

Learning Resources

Text Books	1. Basic and Applied Soil Mechanics – Gopal Ranjan and A.S.R.Rao, New Age International Publishers 2. Soil Mechanics and Foundation Engg (7th edition) by Dr. Arora, K.R., Standard Publisher and Distributors, Delhi, 2010. 3. A Text book of Soil Mechanics and Foundation Engineering – B.C.PunmiaLaxmi Publications.
Reference Books	1. Foundation Analysis & Design by Bowles, J.E., McGraw- Hill Book Co. 2. A Text book of Soil Mechanics and Foundation Engineering – P.Purushotthama Raj, Pearson Education. 3. Introduction to Soil Mechanics- Braja M Das.
e-Resources& other digital material	1. https://nptel.ac.in/courses/105/101/105101201/ 2. http://jntuk-coeerd.in/