DEPARTMENT OF CIVIL ENGINEERING

SCHEME OF COURSE WORK

Course Title:	**GEOTECHNICAL ENGINEERING LAB**		
Course Code:	**20CE1116**	**L T P C:**	**0 0 3 1.5**
Program:	**B. Tech.**		
Branch:	**Civil Engineering**		
Semester:	**VI**		
Prerequisites:	**Geotechnical Engineering-I, Geotechnical Engineering-II**		
Courses to which it is a prerequisite:	-		

Course Outcomes (COs):

At the end of the course, the student will be able to:

CO1: Identify index properties of soils for classification purposes.

CO2: Estimate the soil permeability.

CO3: Determine the settlement characteristics of soils.

CO4: Determine the compaction characteristics of soils.

CO5: Estimate the strength parameters of soils.

Program Outcomes (POs):

1. Graduates will be able to apply the knowledge of mathematics, science, engineering fundamentals to solve complex civil engineering problems.
2. Graduates will attain the capability to identify, formulate and analyse problems related to civil engineering and substantiate the conclusions
3. Graduates will be in a position to design solutions for civil engineering problems and design system components and processes that meet the specified needs with appropriate consideration to public health and safety.
4. Graduates will be able to perform analysis and interpretation of data by using research methods such as design of experiments to synthesize the information and to provide valid conclusions.
5. Graduates will be able to select and apply appropriate techniques from the available resources and modern civil engineering and software tools, and will be able to predict and model complex engineering activities with an understanding of the practical limitations.
6. Graduates will be able to carry out their professional practice in civil engineering by appropriately considering and weighing the issues related to society and culture and the consequent responsibilities.

7. Graduates will be able to understand the impact of the professional engineering solutions on environmental safety and legal issues.
8. Graduates will transform into responsible citizens by resorting to professional ethics and norms of the engineering practice.
9. Graduates will be able to function effectively in individual capacity as well as a member in diverse teams and in multidisciplinary streams.
10. Graduates will be able to communicate fluently on complex engineering activities with the engineering community and society, and will be able to prepare reports and make presentations effectively.
11. Graduates will be able to demonstrate knowledge and understanding of the engineering and management principles and apply the same while managing projects in multidisciplinary environments.
12. Graduates will engage themselves in independent and life-long learning in the broadest context of technological change while continuing professional practice in their specialized areas of civil engineering.

PSOs:

1. Collect, process and analyse the data from topographic surveys, remote sensing, hydrogeological investigations, geotechnical explorations, and integrate the data for planning of civil engineering infrastructure.

2. Analyse and design of substructures and superstructures for buildings, bridges, irrigation structures and pavements.

3. Estimate, cost evaluation, execution and management of civil engineering projects.

Course Outcome versus Program Outcomes & Program specific outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	2	2	2	-	2	-	2	-	-	2	2	2
CO2	2	2	2	2	1	-	-	-	-	-	-	-	1	2	-
CO3	3	3	2	2	2	-	-	-	-	-	-	-	1	2	-
CO4	3	3	2	2	2	-	-	-	-	-	-	-	1	2	-
CO5	2	2	2	2	2	2	-	-	-	-	-	-	1	3	2

S - Strongly correlated, M - Moderately correlated, *Blank - No correlation*

Assessment Methods:	Assignment / Viva / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week	Topics	CO	Sample questions	Teaching-learning strategy	Assessment Method & Schedule
1	Introduction to lab	1			
	1. Sieve Analysis 2. Sedimentation		1. Define consistency and plastic limit.		Checking

2-8	Analysis 3. Specific Gravity Test 4. Field density- Core cutter and Sand Replacement Methods 5. Atterberg's Limits. 6. Permeability of soil using Constant Head test and Variable Head test 7. Compaction Test	1, 2	2. Consistency tests are conducted on the fraction of soil passing through_____. 3. According to Atterberg limits, the soil is said to be of medium plasticity if the plasticity index PI is_____.	Experiment	Observation note book, Record correction and Viva
9	**MID TEST – I**				
10-16	8. CBR Test 9. Consolidation Test 10. Unconfined Compression Test 11. Direct Shear Test. 12. Vane Shear Test 13. Triaxial Test	3, 4, 5	1. Define consolidation 2. Direct shear test is suitable for type of soils.	Experiment	Checking Observation note book, Record correction and Viva
17	**MID TEST – II**				
18	**END EXAM**				