III Year-II Semester
(20CE6113) Soil Mechanics Lab

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
15	35	50	-	-	3	1.5

Pre- Requisites: Fundamentals of geotechnical engineering

Course Objectives:

- To impart knowledge of determination of index properties required for classification of soils.
- To teach how to determine compaction characteristics and consolidation behavior from relevant lab tests; to determine permeability of soils.
- To teach how to determine shear parameters of soil through different laboratory tests.

LIST OF EXPERIMENTS

1. Specific gravity, G
2. Atterberg's Limits.
3. Field density-Core cutter and Sand replacement methods
4. Grain size analysis by sieving
5. Hydrometer Analysis Test
6. Permeability of soil - Constant and Variable head tests
7. Compaction test
8. Consolidation test (to be demonstrated)
9. Direct Shear test
10. Triaxial Compression test (UU Test)
11. Unconfined Compression test
12. Differential free swell (DFS)
13. CBR Test

At least **Ten E**xperiments shall be conducted.

LIST OF EQUIPMENT:

1. Casagrande's liquid limit apparatus.
2. Apparatus for plastic and shrinkage limits
3. Field density apparatus for
   a) Core cutter method
   b) Sand replacement method
4. Set of sieves: 4.75mm, 2mm, 1mm, 0.6mm, 0.42mm, 0.3mm, 0.15mm, and 0.075mm.
5. Hydrometer
6. Permeability apparatus for
   a) Constant head test
   b) Variable head test
7. Universal auto compactor for I.S light and heavy compaction tests.
8. Shaking table, funnel for sand raining technique.
9. Apparatus for CBR test
10. 10 tons loading frame with proving rings of 0.5 tons and 5 tons capacity
11. One dimensional consolation test apparatus with all accessories.
12. Triaxial cell with provision for accommodating 38 mm dia specimens.
13. Box shear test apparatus
14. Hot air ovens (range of temperature 500 - 1500C

Course Outcomes:

S.No	COURSE OUTCOMES	BTL
1	Determine Specific Gravity, Atterberg's limits and Differential free swell for clayey soils	L4
2	Determine relative density, dry density & moisture contents in the field and laboratory	L4
3	Determine permeability and analyze coarse and fine grain sizes	L4
4	Determine shear strength and shear strength parameters by vane shear, tri-axial, direct shear & unconfined compression tests	L4
5	Determine CBR value and consolidation settlement & swell pressure in laboratory	L4

Correlation of Cos with POs & PSOs:

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

Reference:

1. Determination of Soil Properties, J. E. Bowles.
2. IS Code 2720 – relevant parts.