

Course Type	Course Code	Name of Course	L	T	P	Credit
DP	CEC 304	Geotechnical Engineering Laboratory	0	0	2	2

Course Objective

To conduct various testing on soils and evaluate their engineering characteristics by laboratory procedures.

Learning Outcomes

Upon successful completion of this laboratory, students will:

- Be able to perform the various laboratory experiments on soils
- Able to compute and analyze the results of the respective laboratory tests

Unit No.	Topics to be Covered	Laboratory	Learning Outcome
1	Experiment 1 Atterberg limits of soil: Liquid limit, Plastic limit, and Shrinkage limit, Free swell index of soil	1	Determine the Atterberg Limits of clayey soil
2	Experiment 2 Field unit weight (field density): Core cutter, and Sand replacement method	1	Able to find the in-situ density of soil strata
3	Experiment 3 Compaction of soil: Standard/Modified proctor test	1	Study the dry density and Moisture content relationship
4	Experiment 4 Laboratory permeability of soil: Falling head and Constant head method	1	Determine the Permeability of the given soil sample
5	Experiment 5 Consolidation characteristics of soil: Consolidation/ Oedometer test	1	Evaluate various consolidation parameters
6	Experiment 6 Shear Strength of soil: Vane shear and Direct shear test	1	Evaluate the strength parameter of soil
7	Experiment 7 Shear Strength of soil: Unconfined Compression test	1	Evaluate the strength parameter of soil
8	Experiment 8 Shear Strength of soil: Unconsolidated Undrained triaxial test	1	Evaluate the strength parameter of soil
9	Experiment 9 California Bearing Ratio of soil: Soaked/Unsoaked CBR test	1	Evaluate the CBR value of subgrade for the design of pavements
10	Experiment 10 Determination of electromagnetic properties of soil	2	Determination of in-situ properties of soil electromagnetic properties
11	Project, Revision, and Evaluation	3	Minor project

Text Books:

1. Respective Bureau of Indian Standard/International Standard Codes of Practices.
2. Mandal, J.N. and Divshikar, D.G. (1994). Soil Testing in Civil Engineering, Oxford & IBH Publishing Company Pvt. Ltd., New Delhi, India.
3. Sivakugan, N., Arulrajah, A. and Bo, M.W. (2011). Laboratory Testing of Soils, Rocks and Aggregates, J. Ross Publishing.