Course Type	Course Code	Name of the course	L	T	P	Credit
DP	NCEC524	Experimental Geotechnics I: Laboratory Testing	0	0	3	1.5

Course Objective
• To evaluate the engineering characteristics of soil, rock and waste materials by laboratory procedures.
Learning Outcomes
After studying this course, students should be able to: • Students will be able to conduct the tests in laboratory and get exposure to advanced apparatus in the field of geotechnical engineering.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1.	Introduction to soil testing equipment, Preparation of samples: sand, clay and rock.	**3**	Learn to prepare different types of samples for laboratory testing
2.	Evaluation of Electromagnetic Properties of soil.	**3**	Finding the Electromagnetic Properties of soil
3.	Evaluation of Consolidation properties of soil using Oedometer test.	**3**	Learn to find out the Consolidation behavior of soil
4.	Interface shear tests using large direst shear test.	**3**	Finding the interface properties of geomaterials with different materials.
5.	Unconsolidated undrained triaxial test on clay soil using Triaxial test setup.	**3**	Finding the unconsolidated undrained shear properties of soil.
6.	Consolidated drained triaxial test on sand using Triaxial test setup.	**3**	Finding the drained shear properties of granular materials.
7.	Cyclic triaxial shear test on geomaterials.	**3**	Finding the cyclic shear properties of geomaterials.
8.	Uniaxial compression, Split tensile and Point load tests of rock samples.	**3**	Finding the uniaxial compression and tensile properties of Rock Rock.
9.	Physical (e.g. Thickness, AOS, Stiffness, Specific gravity etc) properties testing of geosynthetics	**3**	Finding the physical properties of geosynthetic materials
10.	Wide-width tensile test (Mechanical properties) on Geosynthetic samples.	**3**	Finding the tensile properties of Geosynthetics.
11.	Trapezoidal tear test (Survivability Characteristics) on Geosynthetic samples.	**3**	Finding the tearing strength of Geosynthetics.
12.	Static and Dynamic puncture tests (Survivability Characteristics) on Geosynthetic samples.	**3**	Finding the static and impact strength of Geosynthetics.
13.	Hydraulic (e.g. permittivity, Transmissivity) properties testing of geosynthetics.	**3**	Finding the Hydraulic properties of geosynthetic materials.
14.	Project	**3**	
	Total Contact hours	**42**	

Text Books:

1. Sivakugan, N., Arulrajah, A. and Bo, M.W. (2011). Laboratory Testing of Soils, Rocks and Aggregates, J.Ross Publishing.
2. Respective Bureau of Indian Standard/ International Standard Codes of Practices.

Refference Books:

1. Bowles, J.E. (2012). Engineering Properties of Soil and their Measurement, 4th Edition, McGraw Hill (India) Publishers.
2. Mandal, J.N. and Divshikar, D.G. (1994). Soil Testing in Civil Engineering, Oxford & IBH Publishing Company Pvt. Ltd., New Delhi, India.