B. Tech. Engineering				
Course code and name	**Course Structure**			**Pre-Requisite**
CE415: Geotechnical Exploration and Excavation Methods	**L**	**T**	**P**	**CE206: Soil Mechanics**
	3	**1**	**0**	

S. No	Course Outcomes (CO)
CO1	Students understand: origin and nature of soils, geotechnical exploration, borings, and their layout
CO2	Students understand: samples and samplers, mechanisms, and work procedures of a variety of in-situ tests
CO3	Students understand: various correlations developed from in-situ tests and their usage. Exploration in rocks, equipment, results and correlations
CO4	Students understand: mechanisms, equipment, procedures, and correlations for geophysical exploration. Preparation of exploration report. Exploration of landfills and objectives of excavation.
CO5	Students understand: various geotechnical excavations, their protection, stability, and construction.

S. No	Contents
UNIT 1	Origin of soils, nature of different types of soils. Objectives and procedures of geotechnical exploration. Methods of exploratory borings, required depth, and spacing of borings.
UNIT 2	Various samplers and collections of samples. Various in-situ tests: standard penetration test, static cone penetration test (both mechanical and piezocone), dynamic cone penetration test, vane shear test, pressuremeter test, and dilatometer test.
UNIT 3	Various correlations and charts to be developed on the basis of in-situ tests. Methods of exploration in rocks, various types of core barrels and coring bits, typical results, and correlations.
UNIT 4	Various geophysical explorations: methods, equipment, procedures, and correlations. Preparation of subsoil exploration report. Exploration of closed landfill sites. Objectives of geotechnical excavation.
UNIT 5	Protection of excavations and surrounding structures, various methods such as sheet pile walls, braced walls, and coffer dams, their procedures for construction, types of construction, and analysis of stability. Ditches and Tunnels: excavation, stability, and loads.

REFERENCES		
S. No.	**Name of Books/Authors/Publishers**	**Year of Publication / Reprint**
1	Bowles, J. E. “Foundation Analysis and Design”, McGraw-Hill International.	1997
2	Das, B. M. “Principles of Foundation Engineering”, Cengage.	2016
3	Murthy V. N. S., “Advanced Foundation Engineering”, CBS Publishers and Distributers.	2012
4	Singh, Alam. “Soil Engineering in Theory and Practice Volume 1”, CBS Publishers and Distributors.	2014
5	Powrie, William “Soil Mechanics Concepts and Applications.”, CRC Press.	2014
6	Punmia B. C. Jain A. K. Jain A. K. “Soil Mechanics and Foundations” Laxmi Publications.	2022