TENTATIVE TEACHING PLAN (THEORY)

Department: **Civil Engineering**

Name of Teacher: **Prof. Dr. Zaheer Ahmed Almani**

Subject: **Geotechnical Engineering**   Course Code: **CE411**

Batch: **20CE (B+D)**   Year: **4th**   Semester: **(1st) 7th**

Semester Starting Date: **20-11-2023**   Semester Suspension Date: **29-03-2024**

Course Learning Outcomes (CLOs): Upon successful completion of the course, the student will be able to:

CLO	Description	Taxonomy Level	PLO
1	EXPLAIN various soil improvement techniques, their applications and equipment	C2	5
2	ANALYSES the range of soil related problems especially those involving external stresses, shear strengths, earth retaining structures and slope stability	C4	4

S #	Topic	CLOs	No: of lecture/hrs. required
	COMPACTION		
1.	Compaction and its Fundamentals	1	1
2.	Moisture-Density relationship, Factors Affecting Compaction, Compaction Methods	1	1
3.	Standard and Modified Proctor Tests.	1	1
4.	Compaction in the Field, Compaction Equipment & Machinery	1	1
5.	Field Control and Measurements of In-Situ Density	1	2
6.	Problems on the Compaction & Field Density	1	3
	SOIL IMPROVEMENT		
7.	Introduction to Various Soil Improvement Techniques: Basic Principles and Objectives	1	1
8.	Removal and Replacement of soil	1	1
9.	Mechanical and Chemical Stabilization of Soil,	1	1
10.	In-situ Densification, Grouting, Pre-Loading and Vertical Drains	1	1
11.	Soil Reinforcement	1	1
12.	Applications of various Soil Improvement Techniques	1	2
	SHEAR STRENGTH		
13.	Concepts, Shear Strength Parameters, Shear Strength of Cohesive and Cohesion Less Soils	2	1
14.	Mohr Columb's Failure Criterion	2	1
15.	Determination of Shear Strength Parameters in Laboratory: Direct Shear Box Test, Unconfined Compression Test, Vane Shear Test, Triaxial Shear Test.	2	3
16.	Merits and Demerits of Different Tests	2	1
17.	Problems on Shear Strength of Soil	2	4

S #	Topic	CLOs	No: of lecture/hrs. required
	EARTH PRESSURE		
18.	Earth Retaining Structures and Forces Acting on Earth Retaining Structure	2	1
19.	Earth Pressure at Rest , Active and Passive Earth Pressures	2	1
20.	Rankine's Theory of Earth pressures for Cohesive and Non-Cohesive soils	2	2
21.	Columb's Theory of Earth pressures for Cohesive and Non-Cohesive soils	2	2
22.	Earth Pressure Distribution Diagram for Different Loading Conditions	2	1
23.	Problems on Earth Pressure	2	2
	STRESSES IN SOIL MASS		
24.	Principal Problems due to External Stresses in Soil Mass, Boussinesq's Theory, and Its Assumptions	2	1
25.	Boussinesq's Equations for Computing Vertical Stresses Caused by Point Load, Line Load, Uniformly Loaded Strip and Circular Areas	2	1
26.	Boussinesq's Equations for Computing Vertical Stresses Caused by Uniform Load on Rectangular Areas, Stresses at a Point Outside the Loaded Area	2	1
27.	Stress Isobar, Pressure distribution Diagrams on Horizontal and Vertical Planes	2	1
28.	Equivalent Point Load Method, Newmark Influence Chart for Vertical Pressure, 2:1 Approximate Method	2	1
29.	Problems on Stress Distribution	2	2
	STABILITY OF SLOPES		
30.	Types of Slopes, Slope Failures and Factor of Safety	2	1
31.	Factors Affecting Stability and Remedial Measures,	2	1
32.	Stability of Infinite slopes, Stability Number	2	1
33.	Stability Analysis of Finite Slopes: Taylor's Chart, Friction Circle, Method of Slices.	2	1
34.	Problems on Slope Stability	2	2
	Total		48

Signature of Teacher: Dated: 11/12/2023

Remarks of DMRC: **APPROVED**

Signature of Chairman: Dated: 21/12/2023