## MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY, JAMSHORO.



FRM-001-QSP-004 DEC.01, 2001.

## **TENTATIVE TEACHING PLAN (THEORY)**

Department: Civil Engineering

Name of Teacher: Prof. Dr. Aneel Kumar/Engr. Ali Raza Lashari	
Subject: Geotechnical Engineering	Course Code: CE411

Batch: 20CE(A+C)

Semester Starting Date: 20-11-2023

Year: 4<sup>th</sup> Semester: (1<sup>st</sup>) 7<sup>th</sup>

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

<b>S</b> #	Торіс	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 #	Торіс	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:

Aned.

Dated: 19/12/2023

Remarks of DMRC: APPROVED



Dated: 21/12/2023

Signature of Chairman: