

**TENTATIVE TEACHING PLAN (THEORY)**Department: **Civil Engineering**Name of Teacher: **Dr. Muhammad Rehan Hakro**Subject: **Foundation Engineering**Course Code: **CE426**Batch **20CE (B+C)**Year **4th** Semester **8th**Semester Starting Date: **15-07-2024**Semester Suspension Date: **06-11-2024****Course Learning Outcomes (CLOs):** Upon successful completion of the course, the student will be able to:

CLO	Description	Taxonomy Level	PLO
1	DISCUSS soil investigation techniques, in situ tests and equipment	C2	5
3	DESIGN shallow and pile foundations. Discuss earthen dam components and design parameters	C6	3

S #	Topic	CLOs	No: of lectures/hrs. required
SOIL EXPLORATION			
1.	Importance of soil exploration and planning of soil exploration program.	1	2
2.	Soil exploration methods: probing, test pits, auger boring, wash percussion and rotary drilling and geophysical methods. Soil samplers: disturbed and undisturbed sampling.	1	2
3.	In situ tests: standard penetration test, cone penetration test, and field vane shear test.	1	2
4.	Coring of rocks, core recovery and RQD.	1	2
5.	Borehole logs and sub soil exploration report.	1	3
FOUNDATIONS			
6.	Purpose and types of foundations. Selection of foundation type. Types of bearing capacities of foundation. Gross and net pressures on footing.	2	2
7.	Failure modes in foundations and their characteristics and criterion. General requirements for foundation design.	2	1
SHALLOW FOUNDATIONS			
8.	Techniques to obtain bearing capacity of shallow foundations. Development of bearing capacity theory.	2	2
9.	Terzaghi's theories to calculate bearing capacity. Effects of water table. Design of strip, isolated, combined and raft footings.	2	2
10.	Bearing capacity theories of Meyerhof's, Hansen's, Vesic's and Skempton's.	2	2
11.	Elastic settlement of shallow foundations based on theory of elasticity. Elastic and consolidation settlement of shallow foundations on saturated clays. Settlement of sandy soil. Presumptive values.	2	3
12.	Plate load test. Settlement and bearing pressure measurements and interpretations	2	3
13.	Problems on geotechnical design of shallow foundations	2	3

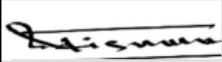
S #	Topic	CLOs	No: of lecture/hrs. required
PILE FOUNDATIONS			
14.	Introduction to deep foundations. Types of deep foundations. Reasons to use piles. Classification of piles. Methods of installation	2	2
15.	Load transfer mechanism of piles, Load carrying capacity of piles in different soils. Negative skin friction. Empirical relationships.	2	4
16.	Settlement of Piles. Pull out resistance of piles.	2	3
17.	Pile driven formulas. Pile load test.	2	2
18.	Group piles: Group efficiency, elastic and consolidation settlement of group piles, up lift capacity of group piles.	2	2
19.	Problems on geotechnical design of pile foundations	2	2
FOUNDATIONS ON DIFFICULT SOILS			
20.	Foundation on layered soils, foundation on collapsible soils, foundations on expansive soils	2	3
EARTHEN DAMS			
21.	Types of earthen dams, components and their functions. General design considerations and typical cross-section and introduction to relevant software	2	1



Signature of Teacher:

Dated: 10/09/2024

Remarks of DMRC: **APPROVED**

Signature of Chairman: 

Dated: 18/09/2024