



MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY JAMSHORO

Department of Civil Engineering

LESSON PLAN

COURSE TITLE: Foundation Engineering	COURSE CODE: CE426	CREDIT HOURS: 03	MINIMUM CONTACT HOURS: 48
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COURSE INSTRUCTOR: **Dr. Zaheer Ahmed Almani (A+D) / Dr. Rehan Hakro (B+C)**

Batch: 20CE	Semester: 8 th	Semester Starting Date: 15-07-2024	Semester Suspension Date: 06-11-2024
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COURSE LEARNING OUTCOMES:

CLO No.	Description	Taxonomy level	Associated PLO
1	DISCUSS soil investigation techniques, in situ tests and equipment.	C2	5
2	DESIGN shallow and pile foundations; and discuss earthen dam components and design parameters.	C6	3

LESSON CONTENTS AND ASSOCIATED CLO(s)




Contents	CLO No.	Marks Assigned	Delivery Methods	Assessment Methods (Marks)
<p>SOIL EXPLORATION</p> <ul style="list-style-type: none"> • Importance of soil exploration and planning of soil exploration program, • -Soil exploration methods: probing, test pits, auger boring, wash percussion and rotary drilling and geophysical methods • Soil samplers: disturbed and undisturbed sampling. • In situ tests: standard penetration test, cone penetration test, and field vane shear test. • Coring of rocks, core recovery and RQD. • Borehole logs and sub soil exploration report. <p>No. of lectures required: 11</p>	1	22	Class Lecture Discussion Problems	Mid Exam (20) Assignment I (2)
<p>FOUNDATIONS</p> <ul style="list-style-type: none"> • Purpose and types of foundations. Selection of foundation type • Types of bearing capacities of foundation. • -Gross and net pressures on footing. • -Failure modes in foundations and their characteristics and criterion. • General requirements for foundation design. <p>- No. of lectures required: 03</p>	2	06	Class Lecture Discussion Problems	Final Exam (06)

<p>SHALLOW FOUNDATIONS</p> <ul style="list-style-type: none"> • Techniques to obtain bearing capacity of shallow Foundations • Development of bearing capacity theory. • Terzaghi's theories to calculate bearing capacity. • Effects of water table. • Design of strip, isolated, combined and raft footings. • Bearing capacity theories of Meyerhof's, Hansen's, Vesic's and skempton. • 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. • Plate load test. • Problems on geotechnical design of shallow foundations <p>No. of lectures required: 15</p>	2	32	<p>Class Lecture</p> <p>Discussion</p> <p>Problems</p>	<p>Class Test-I (05)</p> <p>Final Exam (24)</p> <p>Assignment -II (03)</p>
<p>PILE FOUNDATIONS</p> <ul style="list-style-type: none"> • Introduction to deep foundations. Types of deep foundations. •Reasons to use piles. Classification of piles. Methods of Installation. •Load transfer mechanism of piles, Load carrying capacity of piles in different soils. Negative skin friction. •Empirical relationships. • Settlement of Piles. <ul style="list-style-type: none"> • Pull out resistance of piles. • Pile driven formulas. Pile load test. • Group piles: Group efficiency • Elastic and consolidation settlement of group piles • Up lift capacity of group piles. • Problems on geotechnical design of pile foundations <p>No. of lectures required: 15</p>	2	32	<p>Class Lecture</p> <p>Discussion</p> <p>Problems</p>	<p>Assignment-III (3)</p> <p>Class Test-II (05)</p> <p>Final Exam (24)</p>

FOUNDATIONS ON DIFFICULT SOILS <ul style="list-style-type: none"> • Foundation on collapsible soils • Foundations on expansive soils No. of lectures required: 03	2	06	Class Lecture Discussion Problems	Final exam (06)
EARTHEN DAMS <ul style="list-style-type: none"> • Types of earthen dams, components and their functions. • General design considerations and typical cross-section No. of lectures required: 01	2	02	Class Lecture Discussion Problems	Assignment-IV (02)

ASSESSMENT DETAILS

S. No.	Assessment Activities	Marks	Activities		CLO(s) to be assessed
1	Class Test/Assignment/Project Design/Presentation/Quiz/Field Report	20	Assignment(s)	4	1 and 2
			Class Test	2	2
2	Mid Semester Exam	20	1		1
3	Final Semester Exam	60	1		2

Prepared by: Dr. Zaheer Ahmed Almani Signature:  Signature: Dated: 25-05-2023	Reviewed by: Curriculum Review Committee Signature:  Dated: 30-05-2024	Approved by: Chairman, CED Signature:  Dated: 30-05-2024
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