

University of Engineering and Technology, Taxila
Department of Civil Engineering

Course Title:	Soil Mechanics-II (CE-303)
Pre-requisite(s):	Soil Mechanic-I
Credit Hours:	2 + 1
Contact Hours:	2 + 3
Text Book(s):	<ol style="list-style-type: none">1. Advanced Soil Mechanics by B.M Das.2. Foundation Analysis and Design by Bowles.3. Geotechnical Engineering by Codout
Reference Book(s):	<ol style="list-style-type: none">1. An Introduction to Geotechnical Engineering, Holtz and Kovacs2. Principals of Foundation Engineering by B.M Das

Catalog Data:

Soil Formation Cycle, Soil Classification Systems, Phase relationships, Permeability of Soils, Shear Strength of Soil, Soil Exploration Techniques, and Compaction of Soil.

Course Objectives:

The purpose of this course is to provide the students with an in-depth knowledge and understanding of stresses in soil, vertical and lateral earth pressures and the determining bearing capacity of soil. The knowledge consolidation and permeability of soil; Parameters for design of foundation/footing. Settlement and time rate of settlement.

Course Learning Outcomes:

At the end of this course, the student will:

CLO 1: Understand the Application of Various Loads on Soil and Their Effect at Variable Depths

CLO 2: Comprehend Design Concepts of Foundations, The Concept of Consolidation and Settlement

CLO 3: Understand the Stress Distribution Theories, Bearing Capacity of Soils and Slope Stability

CLO 4: Learn Soil Stabilization Techniques

CLO 5: Learn Different Types of Dams and Design Considerations

Course Contents:

- Normally consolidated and over-consolidated clays. Determination of pre-consolidation pressure. Time-settlement diagrams. Settlement analysis. Theories of settlement.
- Permeability through stratified soils. Seepage, Quick sand conditions, Piping, Design of filters.
- Stress Distribution, Westergaard and Boussineq's theories. Pressure bulb, stress distribution diagram on horizontal and vertical planes. Stress at a point outside the loaded area. New mark's influence charts. Vertical stresses due to a line and strip loads.
- Bearing Capacity. Sources of obtaining bearing capacity. Pre-sumptive values. Plate loading and penetration tests. Terzaghi's theory and analysis. Hanson's theory, effect of water table.
- Active and passive earth pressure. Pressure at rest. Coulomb's and Rankine's theories. Pencelete method. Coulomb's method.
- Types of slopes, Factors affecting stability, Methods of stability analysis. Types of failure and remedial measurements.
- Soil Stabilization Basic principles and objectives. Various methods
- Types of dams. Components and functions, earth dams. General design consideration and typical cross-section

Grading Policy:

Sr. No.	Grading	% of Total Marks
1	Assignments	10
2	Quizzes	10
3	Lab. Work	20
4	Midterm Exam	20
5	Final Exam	40

PLO's \ CLO's	CLO 1	CLO 2	CLO 3	CLO 4
PLO 1 (Engineering Knowledge)	✓	✓		✓
PLO 2 (Problem Analysis)				✓
PLO 3 (Design/Development of Solutions)	✓	✓	✓	✓
PLO 4 (Investigation)			✓	
PLO 5 (Modern Tool Usage)				
PLO 6 (The Engineer and Society)				
PLO 7 (Environment and Sustainability)				✓
PLO 8 (Ethics)				
PLO 9 (Individual and Team work)				
PLO 10 (Communication)				
PLO 11 (Project Management)				
PLO 12 (Lifelong Learning)				✓

Assessment Modules \ CLOs	CLO 1	CLO 2	CLO 3	CLO 4
Assignments	✓	✓	✓	✓
Quizzes	✓	✓	✓	✓
Midterm Exam	✓	✓		
Final Exam	✓	✓	✓	✓