

University of Engineering and Technology, Taxila
Department of Civil Engineering

Course Title:	Foundation Engineering (CE-405)
Pre-requisite:	Soil Mechanics-I Soil Mechanics-II
Credit Hours:	2 + 1
Contact Hours:	2 + 3
Text Books:	1.Foundation Engineering and Design by Joseph E. Bowles 5 th Edition 2.Soil Mechanics and Foundation Engineering by V. N. S. Murthy
Reference Books:	1.Principles of Foundation Engineering by Braja M. Das 2.Foundation Design by Donald P. Coduto 2 nd Edition

Course Objectives:

In this course, you will learn how to plan a site investigation, how to classify and characterize soils for foundation design, how to estimate the capacity of foundations, and how to estimate the settlement of the soil under the foundation load. You will also learn the principles that govern flow of water in soils, settlement and heave of soils, and shear strength of soils. Students will have to present convincing written arguments to define foundation types and testing to solve specific foundation engineering problems. We will discuss actual field problems during the semester and show you how the concepts that are taught in class can be applied to solve real engineering problems.

Course Learning Outcomes:

At the end of this course, the student will:

CLO:1 Learn to select and design the type of foundations according to field conditions.

CLO:2 Be able to calculate the settlements in the soils under the applied loading of various types of structures.

CLO:3 Learn how to handle various types of geotechnical problems at site such high moisture content, applying drainage around and under the structure foundation, preventing foundation from corrosion and excessive settlements due to capillary rise of moisture.

Course Contents:

- Definition, Purpose of foundation and their types, General requirements of foundations.
- Factors governing the depth of footing, Selection of foundation type.
- Design aspects of isolated, combined and strap foundation, Raft Foundation.
- Settlement of foundation, Causes of settlement, Uniform and differential settlement, Differential settlement cracks and their control, Proportioning of footing for a given settlement or equal settlement.
- Dewatering of foundations for construction.
- Introduction to deep foundations, Types of piles, Load carrying capacity of piles, Group action of piles, Negative skin friction, Pile load tests.

Grading Policy:

Sr. No.	Grading	% of Total Marks
1	Assignments	10
2	Un-Announced Quizzes	10
3	Lab Work	20
4	Midterm Exam	20
5	Final Exam	40
Total		100

Student Learning Outcomes:

- To learn about types and purposes of different foundation systems and structures.
- To provide students with exposure to the systematic methods for designing foundations.
- To discuss and evaluate the feasibility of foundation solutions to different types of soil conditions considering the time effect on soil behavior.
- To build the necessary theoretical background for design and construction of foundation systems.

Course Professional Outcome/Industrial Usage:

- The Engineers will be able to plan a soil investigation of a site and can calculate the bearing capacity of a particular site. They will be able to decide which type of footing is suitable on the soil for a specific structure.

- The Engineers will be able to design a foundation for a structure that will be fulfilling the settlement criteria according to the local and international standards.
- The students will be able to handle certain type of field problems such as drainage of a structure, dewatering at construction site and miscellaneous geotechnical problems.

PLO's \ CLO's	CLO-1	CLO-2	CLO-3
1	✓	✓	✓
2	✓	✓	✓
3	✓	✓	✓
4	✓	✓	✓
5	✓	✓	✓
6			
7	✓		
8	✓		
9	✓	✓	
10			
11	✓		✓
12	✓	✓	✓

Assign. \ CLO's Modules	CLO-1	CLO-2	CLO-3
Assignment	✓	✓	✓
Quizzes	✓	✓	✓
Midterm		✓	
Final Term	✓	✓	✓