

Course Description Form

1. Course Name:

Soil Mechanics I

2. Course Code:

CIV053

3. Semester / Year:

First Semester / 2025

4. Description Preparation Date:

23/9/2025

5. Available Attendance Forms:

In person

6. Number of Credit Hours (Total) / Number of Units (Total):

Number of Credit Hours (Total) 5 / Number of Units (Total) 3

7. Course administrator's name (mention all, if more than one name):

Name: عبدالله طالب الياسري

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8. Course Objectives

- Study of a number of cases regarding soil–water relationships, water flow (seepage), stresses applied on soil, and the resistance resulting from these stresses.
- The most important basic concepts of stresses.
- The principle of effective stress.
- Capillary rise in soil.
- Flow nets and their uses.
- Distribution of stresses in soil, and stresses resulting from a concentrated load.

9. Course Outcomes and Teaching, Learning and Assessment Methods**a. Cognitive Objectives**

1. Methods of soil improvement and stabilization.
2. Identifying types of soil.
3. Calculating soil bearing capacity.
4. Identifying engineering properties of soil.
5. Deducing soil stability in the presence of seepage in one direction or both directions.

b. Skill Objectives Specific to the Course

1. Speed and intuition in understanding the course.
2. Ability to connect the outcomes of the chapters with one another.
3. Understanding the mechanics of soil behavior under loads and environmental effects.
4. Deepening knowledge of the applications for which the course is studied.

Teaching and Learning Methods

Illustrative aids are considered among the most important methods for achieving accurate understanding of information and comprehension of behavior. Among these methods are pictures and introductory videos, followed by field visits and the linking they involve between the course concepts and their practical reality.

Assessment Methods

Daily examinations are among the most important assessment methods for students, followed by monthly and semester examinations, in addition to monthly reports that include the study of some phenomena and implications of soil mechanics. These methods also involve student participation in solving some problems and in presenting reports and research.

c. Affective and Value-Based Objectives

1. Clarifying the importance of the soil beneath foundations for the stability of buildings.
2. The importance of building stability in preserving the safety of people and public property.

Teaching and Learning Methods

Presenting illustrative materials regarding the risks resulting from neglecting soil and foundation details.

Assessment Methods

Assessing students through their reports on soil mechanics and methods of improving the soil beneath foundations.

d. General and Transferable Skills (Other Skills Related to Employability and Personal Development)

1. Transferring experience to the student in using soil-laboratory techniques, tools and equipment.
2. Preparing the student to understand the mechanics of soil behavior under loads and environmental conditions, and transferring this knowledge to the fourth stage for the design of various types of foundations and other hydraulic structures.
3. Preparing the student for the first stage of the construction phases in the job market, through the study of the site soil and the appropriate stages for beginning foundation execution.

10. Course Structure

Evaluation method	Learning method	Unit or subject name	Required Learning Outcomes	Hours	Week
Daily and monthly exams with reports and research	In-person lectures with laboratory	Two-Dimensional Flow	• Simulates the true path of water seepage in soils beneath hydraulic structures. • Visualization of a flow net to facilitate the study of the topic.	15	1-4
Daily and monthly exams with reports and research	In-person lectures with laboratory	Stress in a Soil Mass	• Study of the concepts of stresses applied on soil. • Explanation of the types of loads exerted by water or by the soil itself. • Study of additional external loads from foundations and structures above the soil.	15	5-7

Daily and monthly exams with reports and research	In-person lectures with laboratory	Compressibility of Soil	• Study of the consolidation phenomenon in soil beneath foundations, for various soil types. • Special focus on clayey soils, given the great challenge they present in practice.	15	8-11
Daily and monthly exams with reports and research	In-person lectures with laboratory	Shear Strength of Soil	• Study of strain concepts as a reaction to stresses applied on soil. • Explanation of the types of loads exerted by water or the soil itself, in addition to external loads from foundations and structures above the soil.	15	12-14
			• Review of previous chapters	15	15

11. Infrastructure

Soil Mechanics — R.F. Craig
 Soil Mechanics — T.W. Lamb & R.V. Whitman
 Soil Mechanics: Basic Concepts and Engineering Application — A. Aysen

1- Required course books

Advanced Soil Mechanics — Das
 Soil Mechanics Fundamentals

2- Main references (sources)

12. Course Development Plan

In line with the world's move toward the application of sustainability, it is proposed to add a chapter on the use of non-recyclable industrial waste materials in soil reinforcement and the improvement of its physical properties.

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 رئيس قسم الهندسة المدنية

