



# Course Specification

## (Bachelor)

Course Title: **Soil Mechanics**

Course Code: **COE3304**

Program: **Bachelor of Construction Engineering**

Department: **Civil and Environmental Engineering Department**

College: **College of Engineering and Computing in Al-Qunfudhah**

Institution: **Umm Al-Qura University**

Version: **5**

Last Revision Date: **March 2025**



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## A. General information about the course:

### 1. Course Identification

1. Credit hours: ( 3 )

#### 2. Course type

A.  University     College     Department     Track    Others

B.  Required     Elective

3. Level/year at which this course is offered: ( 6/3 )

#### 4. Course General Description:

This course provides a comprehensive introduction to the fundamental principles of soil mechanics. Key topics include weight-volume relationships, particle size distribution, Atterberg limits, and soil classification. The course covers essential concepts such as soil compaction, water flow in soil (permeability and seepage), shear strength, consolidation, and settlement. Emphasis is placed on both theoretical understanding and practical application, with lab sessions and experiments designed to reinforce concepts through hands-on experience.

#### 5. Pre-requirements for this course (if any):

Geological Principles (COE2301)

#### 6. Co-requisites for this course (if any):

#### 7. Course Main Objective(s):

- Recognize soil classification and its physical properties.
- Solve problems related to stresses in soil, permeability, compaction and shear strength.
- Explain the theory of consolidation, elasticity.
- Realize the concept of shear strength of soil.
- Conduct experiment, analyze and interpret data.



## 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100 %
2	E-learning	None	None
3	Hybrid <ul style="list-style-type: none"> <li>Traditional classroom</li> <li>E-learning</li> </ul>	None	None
4	Distance learning	None None	

## 3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	45
3.	Field	None
4.	Tutorial	None
5.	Others (specify)	None
<b>Total</b>		<b>75</b>

## B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	Recognize soil classification and its physical properties.	<b>K1</b>	Lecture	Assignments, Quiz, Midterm and final exam
1.2	Explain the concept of shear strength of soil	<b>K1</b>	Lecture	Assignments, Quiz, Midterm and final exam
1.3	Explain the theory of consolidation, elasticity	<b>K1</b>	Lecture	Assignments, Quiz, Midterm and final exam



Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
<b>2.0</b>	<b>Skills</b>			
2.1	Solve problems related to stresses in soil, permeability, compaction and shear strength.	<b>S1</b>	Lecture	Assignments, Quiz, Midterm and final exam
2.2	Conduct experiment, analyze and interpret data.	<b>S3</b>	Lecture	Labs
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1				
...				

### C. Course Content

No	List of Topics	Contact Hours
1.	Course Description and Introduction	5
2.	Preliminary definitions and relations.	10
3.	Classification of soil.	10
4.	Soil compaction.	10
5.	Water in soil.	5
6.	Stresses in a soil mass.	10
7.	Compressibility of soils.	10
8.	Shear strength of soils.	10
9.	Quizzes and Midterm Exam	5
<b>Total</b>		<b>75</b>

### D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	2, 5, 8, 11, 14	10%
2.	Quizzes	5, 10	10%
3.	Lab exam	15	20%
4.	Midterm exam	7 or 8	20%
5.	Final exam	16 or 17	40%



\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

## E. Learning Resources and Facilities

### 1. References and Learning Resources

<b>Essential References</b>	Das, B. M, "Principles of Geotechnical Engineering", Cengage Learning; 10th edition, December 2020. ISBN-13: 978-0357420478
<b>Supportive References</b>	Muniram Budhu, "Soil Mechanics Fundamentals" Wiley-Blackwell; 1st edition August 2015. ISBN-13: 978-1119019657
<b>Electronic Materials</b>	<ul style="list-style-type: none"> <li>• Electronic materials of the required textbook and its PowerPoints slides</li> <li>• Umm Al-Qura LMS related contents</li> </ul>
<b>Other Learning Materials</b>	None

### 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Equipped Classroom
<b>Technology equipment</b> (projector, smart board, software)	Blackboard, Data show, Smart Board
<b>Other equipment</b> (depending on the nature of the specialty)	None

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Indirect
	Instructor	Direct
Effectiveness of Students assessment	Student	Indirect
	Instructor	Direct
Quality of learning resources	Student	Indirect
	Instructor	
The extent to which CLOs have been achieved	Instructor	Direct





Assessment Areas/Issues	Assessor	Assessment Methods
Other		

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

**Assessment Methods** (Direct, Indirect)

### G. Specification Approval

<b>COUNCIL /COMMITTEE</b>	Civil and Environmental Engineering Department Council in Al-Qunfudah
<b>REFERENCE NO.</b>	The fifteenth session of the academic year 1446
<b>DATE</b>	01/05/2025

