Course Specification
(Bachelor)

Course Title:	Soil Mechanics (1)
Course Code:	CE 2202
Program:	Bachelor of Science in Civil Engineering
Department:	Civil Engineering Department
College:	College of Engineering& Architecture
Institution:	Umm Al-Qura University
Version:	1
Last Revision Date:	31 January 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: (Level 7 / 4th Year)					
4. Course General Description:					
This course covers soil composition, physical properties, and mechanical analysis. Key topics include soil classification systems, compaction processes, and permeability. Seepage analysis, flow nets, and effective stress concepts are introduced. Practical applications and laboratory testing methods are emphasized throughout. The course also explores soil-water interactions, seepage pressure, and soil stability. Advanced topics include empirical relations, permeability in stratified soil, and two-dimensional seepage analysis. .					
5. Pre-requirements for this course (if any)**:**					
CE 2201 Principles of Geology					
6. Co-requisites for this course (if any)**:**					
N/A					
7. Course Main Objective(s):					
Introduce the student to different soil types, characteristics and classification systems. Understand geotechnical properties of soil, especially physical properties.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100%
2	E-learning		
3	Hybrid		

No	Mode of Instruction	Contact Hours	Percentage
	• Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	45
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		75

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
1.0	**Knowledge and understanding**			
1.1	To illustrate different geotechnical properties of soil and weight volume relations.	K1	Lectures	Home work Lab examination Written examinations
1.2	To demonstrate different classification systems, major differences and usage.	K1	Lectures	Home work Lab examination Written examinations
1.3	To illustrate total and effective stress in soil and related time dependent soil compressibility.	K2	Lectures	Home work Lab examination Written examinations
2.0	**Skills**			
2.1	To solve soil mechanics problems applying mathematics, theories	S1	Lectures	Home work Written

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	and principles.			examinations
2.2	To assess the relation between physical properties of soil and classification and expected geotechnical soil performance.	S4	Lectures	Home work Written examinations
2.3	To analyze, assess, and compare the design alternatives of hydraulic stability of structures.	S4	Lectures	Home work Written examinations
3.0	**Values, autonomy, and responsibility**			
3.1	3.1	V1	Lectures	Home work Written examinations
3.2	3.2	V2	Lectures	Home work Written examinations

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Soil Mechanics	3
2.	Soil Weight-Volume Relationships	6
3.	Mechanical Analysis of Soil	6
4.	Soil Consistency and Plasticity	3
5.	Clay Mineralogy and Soil-Water Interaction	3
6.	Soil Classification Systems	6
7.	Soil Compaction and Stiffness Enhancement	3

8.	Soil Permeability and Darcy's Law	3
9.	Seepage and Two-Dimensional Flow	3
10.	Seepage-Induced Failures.	3
11	Effective Stress and Seepage Forces	3
15	course review and revision.	3
Total		75

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Home work	Weekly	10
2.	Mid-term exam	5	25
3.	Laboratory and project	1-10	25
4.	Final Exam	16	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

Essential References	Braja M. Das,(2021), Principles of Geotechnical Engineering 10th Edition.
Supportive References	List Required Textbooks Budhu, Muni (2011) "Soil Mechanics and Foundations", John Wily & Sons Supportive References List Essential References Materials (Journals, Reports, etc.) http://www.springer.com/Geotechnical+soil+mechanics
Electronic Materials	List Recommended Textbooks and Reference Material (Journals, Reports, etc) • Budhu, Muni (2011), Soil Mechanics and Foundations, 3rd edition. • Braja M. Das, (2016) Soil Mechanics Laboratory Manual 9th Edition.
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	classroom 40seats, Soil Mechanics laboratory 20 students working in parallel
Technology equipment (projector, smart board, software)	Data show, Laboratory equipment
Other equipment (depending on the nature of the specialty)	Well-equipped computer lab and libraries are available for students for addition resource

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Faculty members who teach this course	• Students questioners running at the semester end, • Analysis of students` marks • Regular feedback of the students about the course and the teaching methods
Effectiveness of Students assessment	Faculty members who teach this course	• Students questioners running at the semester end, • Analysis of students` marks • Regular feedback of the students about the course and the teaching methods
Quality of learning resources	Faculty members who teach	• Frequent

Assessment Areas/Issues	Assessor	Assessment Methods
	this course	improvement for teaching and learning techniques. • Frequent survey for latest references. • Encouraging the students in team work cooperation and writing reports.
The extent to which CLOs have been achieved	Independent member(s) teaching staff	A sample of students answer sheets is revised by a specified committee of the department.
Other	Faculty members who teach this course and those teaching other courses relevant to this course.	Regular revising and improving of the course contents and consulting the faculty members who teach this course and those teaching other courses relevant to this course.

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	CIVIL ENGINEERING COUNCIL
REFERENCE NO.	THE FIFTEENTH SESSION OF THE ACADEMIC YEAR 1446
DATE	30 APRIL 2025

