KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

Soil Mechanics Syllabus			
Course Title	**Soil Mechanics**		
Course Code	**CVE 3320C**	**No. of Credits**	**3 CH**
Department	**Civil and Environmental Departments**	**Faculty**	**Engineering**
Pre-requisites Course Code	**Strength of Materials**	**Co-requisites Course Code**	
Course Coordinator(s)	**Dr. Sabah Saadi Fayaed**		
Email	**sabah.saadi@komar.edu.iq**	**IP No.**	**238**
Other Course Teacher(s)/Tutor(s)	**Non**		
Learning Hours	**Monday And Wednesday (2:00 pm- 3:30 pm)**		
Contact Hours	**Monday And Wednesday (12:00 pm- 2:00 pm)**		
Course Type	**Department Requirement**		
Offer in Academic Year	**Spring 2016**		

COURSE DESCRIPTION

This course covers the principles of soil mechanics and fundamentals of application in geotechnical engineering. This course covers soil behaviors and mechanical properties of soil, engineering classification of soil, permeability and seepage, consolidation and settlement, shear strength, lateral earth pressures and soil bearing capacity. This course also provides students the opportunity to obtain "hands-on" experience with some of the laboratory tests. The style of this syllabus is adopted from Iowa University.

COURSE OBJECTIVES

1. To understand relationships between physical characteristics of soils and mechanical characteristics such as conductivity; strength; compressibility.
2. To learn how to measure both physical and mechanical characteristics of soils through hands-on practice in the lab.
3. Understand the modeling techniques commonly used in soil mechanics and how to apply them. Examples here include:

a. Consolidation models for load-time-deformation response of soils;
b. Mohr-Coulomb shear strength modeling of soils.

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COURSE LEARNING OUTCOME

After participating in the course, students would be able to:

1. Apply fundamental concepts learned previously or concurrently in mathematics, statics, mechanics of deformable bodies, and fluid mechanics to the solution of soil mechanics problems in civil and environmental engineering. **(ABET Outcome E)**

2. Explain the difference between different types of soils in terms of both physical and mechanical characteristics. **(ABET Outcome A)**

3. Design the common tests used to measure soils' physical and mechanical properties and know how to interpret results from such tests. **(ABET Outcome B and E)**

4. Apply fundamental soil mechanics principles to common engineering applications including: **(ABET Outcome E)**

a. Compute time-dependent settlement of a soil deposit after a load is applied.

b. Compute the seepage of groundwater into a constructed excavation, and to assess liquefaction potential.

c. Compute the magnitude of loads that can be applied to a geotechnical system safely without inducing shear failure.

Grading Scale:

Points	Percentage Scores
A	**95-100**
A-	**90-94**
B+	**87-89**
B	**83-86**
B-	**80-82**
C+	**75-79**
C	**70-74**
C-	**65-69**
D+	**60-64**
D	**55-59**
D-	**50-54**
F	**0-49**
W	**Withdrawal**
I	**Incomplete**

Note: The minimum passing grade to pass this course is C-which is equivalent to 65%.

COURSE CONTENT

Course Topics Include:

Chapter 1: Basic characteristics of soils
Chapter 2: Seepage
Chapter 3: Effective stress
Chapter 4: Shear strength
Chapter 5: Stresses and displacements
Chapter 6: Lateral earth pressure
Chapter 7: Consolidation theory
Chapter 8: Bearing capacity

COURSE TEACHING AND LEARNING ACTIVITIES

Course Teaching and Learning Activities:

1. Interactive class discussion
2. Hands- on Exercises
3. Practical Experiments
4. Home work
5. Tests and Quizzes

COURSE ASSESSMENT Tools

Assessment Tool	Description	Weight
Quizzes (5)	Quizzes are scheduled as shown in the semester schedule.	**10 %**
Mid- term	The mid-term will be conducted after week 7 of the semester.	**20 %**
Laboratory work	Laboratory experiments have been developed to coordinate with the content material.	**20 %**
Homework (2)	The H.W will be conducted during the semester.	**5 %**
Test	The test will be conducted after week 11 of the semester.	**10 %**
Project	The project will be conducted in week 13 of the semester	**10 %**
Final Exam	The final exam will be conducted in week 16 of the semester	**25 %**

ESSENTIAL READINGS: (Journals, textbooks, website addresses etc.)

Textbooks:

Principles of Geotechnical Engineering. 8 th Ed., Braja M. Das; Brooks/Cole Publishers, 2001, ISBN: 053438742X.

References:

1- Craig's Soil Mechanics, 7 th edition, R.F. Craig , Taylor & Francis Group. ISBN: ISBN 0–415–32703–2

2- Fundamentals of Soil Behavior, 3rd Ed. James K. Mitchell, Kenichi Soga. Wiley, 2005.

COURSE POLICY *(including plagiarism, academic honesty, attendance etc)*

Attendance Policy:

Students are expected to attend each class for the entire semester. Students are responsible for material present in lectures. Only students with official KUST absence, family crises, and illness are excused from class. Three occasions of lateness count as one absence. The student who misses 10 percent of the classes will be placed on probation.

Make up Policy:

Since all examination are announced in advance, zero grade will be given to any missed examination unless a student's has an acceptable reason, such as illness, for not being able to take the examination during all those days when the examination was announced.

Academic Dishonesty:

Any type of dishonesty (Plagiarism, Copying another's test or home-work, etc) will Not be tolerated. Students found guilty of any type of academic dishonesty are subject to failure in this course, plus further punishment by the University Consul.

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Course calendar: Please check the academic calendar for spring 2016

Week	Beg/End Dates	Topics (Chapters)	CLO	Course Assignments per chapter
1	(28-2 to 3-3) / 2016	**Chapter 1: Basic characteristics of soils** • The nature of soils • Particle size analysis	1	
2	(6-3 to 10-3) / 2016	**Chapter 1: Continued** • Plasticity of fine soils • Phase relationships	1	
3	(13-3 to 17-3) / 2016	**Chapter 2: Seepage** • Soil water • Permeability **Experiment 1: Water Content**	2&4	**Report 1** Write a report to find out the mois **Quiz 1** (Ch.1)
	(20-3 to 24-3) / 2016	**Nawroz Holiday**		
4	(27-3 to 31-3) / 2016	**Chapter 2: Continued** • Seepage theory • Flow nets	2&4	
5	(3-4 to 7-4) / 2016	**Chapter 3: Effective stress** • The principle of effective stress • Response of effective stress to a change in total stress	3	**Quiz 2** (Ch.2)
6	(10-4 to 14-4) / 2016	**Chapter 3: Continued** • Partially saturated soils • Influence of seepage on effective stress **Experiment 2: Unit Weight**	3	**Submitting "H.W1"** **Report 2** Write a report to determine the de
7	(17-4 to 21-4)/ 2016	**Chapter 4: Shear strength** • Shear failure • Shear strength of sands	3	
	(24-4 to 28-4) / 2016	**Mid-term**		**(Ch.1, Ch.2, Ch.3 and Ch.4)**
8	(1-5 to 5-5) / 2016	**Chapter 4: Continued** • Shear strength of saturated clays • The critical-state concept **Experiment 3: Specific Gravity**	3	**Report 3** Write a report to determine the sp a pycnometer.
9	(8-5 to 12-5) / 2016	**Chapter 5: Stresses & displacements** • Elasticity and plasticity • Stresses from elastic theory	2&3	**Quiz 3** (Ch.4)
10	(15-5 to 19-5) / 2016	**Chapter 6: Lateral earth pressure** • Rankine's theory of earth pressure • Coulomb's theory of earth pressure	4	**Quiz 4** (Ch.5)

11	**(22-5 to 26-5) / 2016**	**Chapter 6: Continued** • Application of earth pressure theory to retaining walls • Design of earth-retaining structures **Experiment 4: Direct Shear Test**	**4**	**Submitting "H.W2"** **Report 4** Write a report to determine the she
		TEST		**(Ch. 4, Ch. 5 and Ch.6)**
12	**(29-5 to 2-6) / 2016**	**Chapter 7: Consolidation theory** • Consolidation settlement: one-dimensional • Settlement by the Skempton–Bjerrum method	**4**	
13	**(5-6 to 9-6) / 2016**	**Chapter 7: Continued** • The stress path method • Degree of consolidation	**4**	
14	**(12-6 to 16-6) / 2016**	**Chapter 8: Bearing capacity** • Foundation design • Ultimate bearing capacity	**2&3**	**Quiz 5 (**Ch.7)
15	**(19-6 to 23-6) / 2016**	**Review Week for Academic Courses**		
16	**(26-6 to 30-6) / 2016**	**Final Examination for Academic Courses**		**All the Chapters**