Module (Course Syllabus) Catalogue

2023-2024

College/ Institute	College of Engineering	
Department	Civil Engineering	
Module Name	Soil Mechanics -2	
Module Code	SOE604	
Degree	Technical Diploma ☐ Bachelor √ High Diploma ☐ Master ☐ PhD ☐	
Semester	6th (sixth)	
Qualification	BSc	
Scientific Title	Engineer	
ECTS (Credits)	6	
Module type	Prerequisite ☐ Core √ Assist. ☐	
Weekly hours	5	
Weekly hours (Theory)	(3)hr Class	(162)Total hrs Workload
Weekly hours (Practical)	(2)hr laboratory	
Number of Weeks	15	
Lecturer (Theory+Practical)	Zina M. Dawood	
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Lecturer (Tutorial+ Practical)	Mohamed Moafak Aziz	
E-Mail & Mobile NO.	mohamed.arbili@epu.edu.iq	
Websites		

Course Book

Course Description	**Soil Engineering mechanics is a branch of soil physics and applied mechanics that describes the behavior of soils. Soil mechanic aims to analyze the deformations of flow of fluids within natural and man-made structures that are supported on/in soil. Example of its application including building, bridge foundations, retaining walls, dams and buried pipeline systems.** **Many important contents will be discussed in the theoretical hours such as One dimensional and two dimensional fluid flow into soil, compressibility of the soil and shear strength of the soil. This is to give a clear understanding of soil engineering behavior. Practical hours will be helpful to the students to have a chance of doing several laboratory tests to test different types of soils. Also, the students will be able to conduct laboratory tests and obtain soil properties and parameters from the tests observations and results. To conclude, the students will have the knowledge of understanding the engineering properties of soil to deal with /solve any problem which might face during the site investigation.**
Course objectives	**1. Introduce the students with the essential concepts of the engineering properties of soils as a civil engineer.** **2. Understanding of soils as engineering materials.** **3. Studying the engineering behaviour of soils.** **4. Helping the students to be familiar with the soil sampling, soil testing and site investigation.**
Student's obligation	**Attending the lecture is a fundamental part of the course. You are responsible for material presented in the lecture whether or not it is discussed in the textbook. You should expect questions on the exams to test your understanding of concepts discussed in the lecture and in the homework assignments.** **It can be very helpful to study with a group. This type of cooperative learning is encouraged; however, be sure that you have a thorough understanding of the concepts besides the mathematical steps used to solve a problem. You must be able to work through the problems on your own.** **In addition to that, the students should write a scientific project and prepare a nice presentation which this can be discussed in the campus.**
Required Learning Materials	**Textbooks, handouts, folders, stationaries and printing and copying facilities**

	Task		Weight (Marks)	Due Week	Relevant Learning Outcome
Evaluation	Paper Review				
	Assignments	Homework [2]	5	2	Cognitive skills
		Class Activity	2	2	Intellectual skills
		Report	-		
		Seminar	5	2	Presentation skills
		Essay	-		
		Project	5	2	Writing skills
	Quiz [2]		8	2	understanding skills
	Lab. Report		10	2	Experience of writing and practical skills
	Midterm Exam		10(theo.)+15(Prac.)	2	Knowledge and understanding skills
	Final Exam		20(theo.)+20(Prac.)	1	Knowledge and understanding skills
	Total		100		

Specific learning outcome:	**1. Understand the flow of water through soil in one and two dimensions.** **2. Study the shear strength parameters of soil.** **3. Assess the shear behaviour for undrained and drained conditions.** **4. Understand the soil compressibility performance.** **5. Identify and test the soil behaviour in the soil laboratory.** **6. Evaluate the data to assess the soil.**
Course References:	➢ **Key reference**: **Soil Mechanics - William Lam and Robert Whitman** ➢ **Useful references**: **7. Aysen; soil mechanics basic concept and engineering application.** **8. C.R. scott; soil mechanics and foundation. Third edition.** **9. T. William Lamb and Robert V. Whitman. Soil Mechanics.** **10. Joseph Bowels. Laboratory testing Manual.** ➢ **Magazines and review (internet)**

Course topics (Theory)	Week	Learning Outcome
Principal stress of soil	1	Knowledge skills
Solving examples and discussions	2	Knowledge skills
Soil Shearing behaviour	3	Knowledge skills
Unconsolidated - Undrained triaxial	4	Knowledge skills
Consolidated - Undrained triaxial	5	Knowledge skills
Consolidated - Drained triaxial	6	Knowledge skills
Unconfined Compression test	7	Knowledge skills
Soil compression behaviour	8	Knowledge skills
Soil compression parameters	9	Knowledge skills
Solving examples and discussions	10	Knowledge skills
Soil improvement	11	Knowledge skills
Stress calculations	12	Knowledge skills
Practical Topics	**Week**	**Learning Outcome**
Introduction	1	General skills Writing report skills
Falling head permeability test	2	Experience in practical tests
Constant head permeability test	3	Experience in practical tests
Direct shear test	4,5	Experience in practical tests
Unconfined compression test	6.7	Experience in practical tests
Consolidation test	8.9	Experience in practical tests
Triaxial Test (UU, CU and CD)	10.11,12	Experience in practical tests

Questions Example Design

- ***Compositional:***
  Show the difference between consolidation and compression.

1. **Explain the unconsolidated undrained test**.
2. **Define consolidation?**

- ***True or false type of exams:***
- ***Multiple choices:***

Extra notes: