

COURSE INFORMATION					
Course Title	Code	Semester	L+P+L Hour	Credits	ECTS
ADVANCED SOIL MECHANICS	CE 550	1	3+0+0	3	10

Prerequisites	-
----------------------	---

Language of Instruction	English
Course Level	Master's Degree (Second Cycle Programmes)
Course Type	Departmental Elective
Course Coordinator	-
Instructors	Prof. M. Murat Monkul
Assistants	-
Goals	The goal of this course is to enhance the students understanding of the mechanics and engineering response of soils in an advanced manner.
Content	Introduction; Index properties of soils; soil classification and phase relationships; hydraulic conductivity and seepage in soils; consolidation theory and settlements; stress-strain behavior of soils and drained versus undrained shear strengths.

Course Learning Outcomes	Program Learning Outcomes	Teaching Methods	Assessment Methods
1) Ability to calculate seepage quantity at engineering projects by considering hydraulic conductivity of soils.	5,7,9	1,2	A,C
2) Ability to calculate the amount and timing of the one dimensional settlement in various soil conditions by using consolidation theory.	5,7,9	1,2	A,C
3) Ability to express the stress strain behavior of soils and finding their strength.	5,7,9	1,2	A,C

Teaching Methods:	1: Lecture, 2: Question-Answer, 3: Laboratory, 4: Case-study
Assessment Methods:	A: Exams, B: Experiment, C: Homework, D: Project

COURSE CONTENT		
Week	Topics	Study Materials
1	Introduction and Importance of Soil Mechanics in Civil Engineering	Lecture Notes and Textbook
2	Formation of soils, their physical properties and weight-volume relationships	Lecture Notes and Textbook
3	Atterberg limits and soil classification	Lecture Notes and Textbook
4	Compaction of soils	Lecture Notes and Textbook
5	Hydraulic conductivity and flow through soils -1	Lecture Notes and Textbook
6	Hydraulic conductivity and flow through soils -2	Lecture Notes and Textbook
7	Stresses in soils	Lecture Notes and Textbook
8	Midterm Exam	Lecture Notes and Textbook
9	Compressibility and consolidation of soils -1	Lecture Notes and Textbook
10	Compressibility and consolidation of soils -2	Lecture Notes and Textbook
11	Stress-strain behavior of soils -1	Lecture Notes and Textbook
12	Stress-strain behavior of soils -2	Lecture Notes and Textbook
13	Stress-strain behavior of soils -3	Lecture Notes and Textbook
14	Stability of earth slopes -1	Lecture Notes and Textbook
15	Stability of earth slopes -2	Lecture Notes and Textbook

RECOMMENDED SOURCES	
Lecture Notes	Notes prepared by the instructor
Textbooks	1) "An Introduction to Geotechnical Engineering", Holtz, Kovacs, Sheahan, 2nd Ed., Pearson 2) "Advanced Soil Mechanics", Das, 3rd Ed., Taylor & Francis

MATERIAL SHARING	
Documents	Slides that are given to the photocopy room
Assignments	homeworks are returned to students after they are graded
Exams	exams questions are solved if demanded

ASSESSMENT		
IN-TERM STUDIES	NUMBER	PERCENTAGE
Mid-terms	1	50
Quizzes	-	-
Assignment	6	50
Lab Work	-	-
Term Project	-	-
Total		100
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		40
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		60
Total		100

COURSE CATEGORY	Expertise/Field Courses
------------------------	-------------------------

COURSE'S CONTRIBUTION TO PROGRAM						
No	Program Learning Outcomes	Contribution				
		1	2	3	4	5
1	Attains knowledge through wide and in-depth investigations his/her field and surveys, evaluates, interprets, and applies the knowledge thus acquired.					
2	Has a critical and comprehensive knowledge of contemporary engineering techniques and methods of application.					
3	By using unfamiliar, ambiguous, or incompletely defined data, completes and utilizes the required knowledge by scientific methods; is able to fuse and make use of knowledge from different disciplines.					
4	Has the awareness of new and emerging technologies in his/her branch of engineering profession, studies and learns these when needed.					
5	Defines and formulates problems in his/her branch of engineering, develops methods of solution, and applies innovative methods of solution.				√	
6	Devises new and/or original ideas and methods; designs complex systems and processes and proposes innovative/alternative solutions for their design.					
7	Has the ability to design and conduct theoretical, experimental, and model-based investigations; is able to use judgment to solve complex problems that may be faced in this process.					√
8	Functions effectively as a member or as a leader in teams that may be interdisciplinary, devises approaches of solving complex situations, can work					

	independently and can assume responsibility.					
9	Has the oral and written communication skills in one foreign language at the B2 general level of European Language Portfolio.			v		
10	Can present the progress and the results of his investigations clearly and systematically in national or international contexts both orally and in writing.					
11	Knows social, environmental, health, safety, and legal dimensions of engineering applications as well as project management and business practices; and is aware of the limitations and the responsibilities these impose on engineering practices.					
12	Commits to social, scientific, and professional ethics during data acquisition, interpretation, and publication as well as in all professional activities					

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Excluding the exam weeks: 14x Total course hours)	14	3	42
Hours for off-the-classroom study (Pre-study, practice)	14	7.5	105
Midterm examination	1	3	3
Homework	6	15	95
Project	-	-	-
Final examination	1	3	3
Total Work Load			248
Total Work Load / 25 (h)			10
CTS Credit of the Course			10