

COURSE INFORMATION					
Course Title	Code	Semester	L+P+L Hour	Credits	ECTS
Designing with Geosynthetics	CE 554	-	3+0+0	3	10

Prerequisites	-
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Language of Instruction	English
Course Level	Master's Degree (Second Cycle Programs)
Course Type	Departmental Elective
Course Coordinator	Assoc. Prof. Dr. Hakkı Oral Özhan
Instructors	Assoc. Prof. Dr. Hakkı Oral Özhan
Assistants	-
Goals	To introduce the students the types, main properties and importance of geosynthetics in civil engineering applications; to design with geosynthetics in various civil engineering applications; to teach and apply different analyses in terms of geosynthetics usage.
Content	Types of geosynthetics, functions of geosynthetics, physical, mechanical and hydraulic properties of geosynthetics, drainage, filtration and separation applications of geosynthetics, reinforcement and stabilization applications of geosynthetics, waste landfill applications of geosynthetics, soil improvement applications of geosynthetics.

Course Learning Outcomes	Program Learning Outcomes	Teaching Methods	Assessment Methods
1) Ability to identify types and main properties of geosynthetics.	1, 5, 7	1, 2, 3	A, B
2) Ability to identify functions of geosynthetics in civil engineering.	1, 5, 7	1, 2, 3	A, B
3) Ability to design with geosynthetics in civil engineering applications.	1, 2, 5, 7	1, 2, 3	A, B
4) Ability to identify and interpret the parameters needed for obtaining the engineering properties of geosynthetics.	1, 2, 5, 7	1, 2, 3	A, B

Teaching Methods:	1: Lecture, 2: Problem solving by instructor, 3: Problem solving assignment
Assessment Methods:	A: Written exam, B: Homework

COURSE CONTENT		
Week	Topics	Study Materials
1	Introduction; General description of the course contents and other information about the course	Lecture Notes
2	Description and importance of Geosynthetics in Civil Engineering; Types of Geosynthetics: Geotextiles, Geogrids Geomembranes, Geosynthetics Clay Liners, Geocomposites	Lecture Notes
3	Functions of Geotextiles: Seperation, Filtration, Drainage	Lecture Notes
4	Functions of Geotextiles: Reinforcement	Lecture Notes
5	Functions of Geotextiles: Reinforcement and Stabilization	Lecture Notes
6	Functions of Geogrids	Lecture Notes
7	Functions of Geomembranes	Lecture Notes
8	Midterm exam, Functions of Geocomposites	Lecture Notes
9	Functions of Geocells	Lecture Notes
10	Functions of Geosynthetic Clay Liners	Lecture Notes
11	Slope Stability Applications of Geosynthetics	Lecture Notes
12	Waste Landfill Applications of Geosynthetics	Lecture Notes
13	Soil Improvement Applications of Geosynthetics	Lecture Notes
14	Foundation Engineering Applications of Geosynthetics	Lecture Notes
15	Erosion and Scour Control Applications of Geosynthetics	Lecture Notes

RECOMMENDED SOURCES	
Lecture Notes	These are the notes that the students wrote during the lectures.
Textbook	-
Additional Resources	Designing with Geosynthetics, Robert M. Koerner, Prentice Hall, 5th Edition, 2005 Fundamentals of Geosynthetic Engineering, S.K. Shukla, J.H. Yin, Taylor & Francis, 2006

MATERIAL SHARING	
Documents	-
Homeworks	Homeworks are returned to students after they are graded.
Exams	Exams questions are solved if demanded.

ASSESSMENT		
IN-TERM STUDIES	NUMBER	PERCENTAGE
Midterm (30%)	1	50
Homeworks (30%)	5	50
	-	-
	-	-
	-	-
Total		100
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		40
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		60
Total		100

COURSE CATEGORY	Expertise Courses
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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.			√		

