

METU – Civil Engineering Department
CE562 Applications of Geosynthetics
Spring 2014

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Office Hours: Wednesdays 10:40-12:30, or send an email for a meeting time

Lecture Hours: Thursdays 9:40-12:30 CS2

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Course Catalog Description

Introduction. Basic information on Geosynthetics. Functions, properties and test methods. Road and railway (separation) applications. Filtration, drainage and erosion control applications. Soil reinforcement applications. Geomembranes.

Textbook: **Designing With Geosynthetics**, Robert M. Koerner, 6th edition (vol.1 and 2), January 2012.

Course Content (tentative)

- 1. Introduction**
 - Geosynthetics and Definitions
 - Raw materials, types and manufacturing processes
 - Overview of geotextile functions/applications/requirements
 - General construction techniques
- 2. Geotextiles: Properties and Testing**
 - General / index properties
 - Mechanical properties
 - Hydraulic properties
- 3. Separation applications, Geotextiles in Roads and Railways**
 - Unpaved roads
 - Paved (permanent) roads
 - Geotextile selection considerations in road applications
 - Geotextiles in railway applications
- 4. Filtration, drainage and erosion control applications**
 - Conventional (granular) filter design
 - Mechanism of geotextile filtration
 - Geotextile filter (soil retention) and permeability criteria
 - Applications
- 5. Soil Reinforcement applications**
 - Geotextile and soil properties in reinforcement applications
 - Steep-faced embankments (reinforced slopes)
 - Embankments on soft ground
 - Reinforced soil retaining walls
- 6. Geomembranes**
 - Geomembrane properties and test methods
 - Liquid containment / canal lining applications
 - Landfill basal and cover (cap) lining applications
- 7. Other geosynthetics**

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Tentative Schedule:

Week	Date (2014)	Topic	Page Numbers	Activity (tentative)
1	02 / 20	Introduction	2-14, 33-78	-
2	02 / 27	NO CLASS (ASCE Geocongress 2014 at Atlanta)	-	-
3	03 / 06	Geotextile Properties and Testing	92-97, 103-190	- Term Paper topic and abstract due
4	03 / 13			-Quiz1 -HW1 given
5	03 / 20	Separation applications, Geotextiles in Roads and Railways	190-206, (geogrid 403-414)	-HW1 due, -HW2 given
6	03 / 27			-HW2 due
7	04 / 03	Filtration, drainage and erosion control applications	108-117, 262-300 but sections 2.8.6 and 2.9.5 not included, 862-887	-Quiz2 -HW3 given
8	04 / 10			-HW3 due
9	04 / 17	Soil reinforcement applications	206-262, 414-453	-MIDTERM EXAM
10	04 / 24			-HW4 given
11	05 / 01	NO CLASS (National Holiday)	-	-
12	05 / 08	Geomembranes	509-555, 564-604, 613-623, 687-720, 695-710	-HW4 due -HW5 given
13	05 / 15			-HW5 due -Quiz3
14	05 / 22	Other geosynthetics topics	GCL 750-798, Geofoam 806-831, Geocell 852-859	-Term Paper Presentations

GRADING: 25% Midterm Exam
20% Assignments and Quizzes
20% Term Paper and Presentation
30% Final Exam
5% Attendance and participation

Exams: Exams will have Part 1 and Part 2. Part 1: closed book, Part 2: open book.

Assignments and Quizzes:

Design problem, a short research, papers to be read and criticized, short answer quizzes etc.

Term paper and presentation:

You need to prepare a paper related to geosynthetics that is to be submitted to a conference or to a journal. A thorough literature review is required, describing the main conclusions of the previous studies and identifying remaining issues/challenges that are still needed to be studied and propose future work. The paper should include your own computations, analyses, or laboratory experiments, and present discussion of the results.

Topic and Abstract: Topic title, max. 1 page abstract, and a reference list on the topic should be submitted. Topics will be approved by the instructor. You need to meet with the instructor frequently during the semester, to show and discuss your work on the paper.

Paper: Max. 12 pages long, ASCE paper guidelines:

<http://www.asce.org/Audience/Authors,-Editors/Books/Proceedings-Papers/Conference-Proceedings-Author-s-Guide/>

Papers will be screened through TURNITIN software for authenticity.

Presentation: A 10-minute presentation of each term paper will be made on the last day of class.