CEE 176 - Environmental Geotechnics

Spring 2015

Instructor: Nicholas Sitar, sitar@ce.berkeley.edu
Office: 449 Davis
Office Hours: W, Th 10-11:30 a.m. or by appointment

GSI: Robert Lanzafame, rlanzafame@berkeley.edu
Office Hours: TBD

Course Objectives:

To introduce the field of Environmental Geotechnics and to examine the problems of site investigation, site restoration, and waste disposal and containment from the perspective of modern geotechnical practice. To provide an understanding of the constraints/limitations of the state of the art in subsurface site restoration and remediation.

Text: Sharma, H.D., and Lewis, S.P., "Waste Containment Systems, Waste Stabilization, and Landfills," John Wiley & Sons, Inc., 1994

Other Recommended Reading:

1. Mitchell, J.K. and Soga, K., "Fundamentals of Soil Behavior," John Wiley & Sons, Inc., 3rd ed., 2005.
2. Qian, X., Koerner, R.M. and Gray, D.H., "Geotechnical Aspects of Landfill Design and Construction, " Prentice Hall, 2002.
3. Daniel, D.E., editor, "Geotechnical Practice for Waste Disposal," Chapman&Hall, 1993.
4. Selected notes and reading materials will be made available on b-space.

Prerequisites: CE 175 or equivalent; CE 173 or equivalent desirable

Grading:		
	Assignments	30%
	Midterm, March 19	30%
	Final, Exam Group 15, Th, May 14, 3-6 pm	40%

Assignments: Assignments will be due one week after being handed out, unless otherwise specified.

University of California, Berkeley Department of Civil and Environmental Engineering

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Tentative Course Outline

Week	Date	Topic
1	Jan 20	Overview of the issues in waste disposal and remediation, statues and regulations,
	Jan 22	Soil and soil composition
2	Jan 27	Properties of soil minerals
	Jan 29	Soil-water-chemical system
3	Feb 3	Hydraulic conductivity
	Feb 5	Soil-waste interactions
4	Feb 10	Compaction and Properties of Compacted Soils
	Feb 12	Geosynthetics "
5	Feb 17	Liners and Covers
	Feb 19	Design of Lined Repositories
6	Feb 24	Chris Glenn, Langan
	Feb 26	Vertical Barrier Systems
7	Mar 3	Vertical Barrier systems - slurry walls, grouting
	Mar 5	Contaminant transport
8	Mar 10	Contaminant transport
	Mar 12	Contaminant transport
9	Mar 17	**Midterm**
	Mar 19	TBD
10	Mar 26	*Spring Recess*
	Mar 28	*Spring Recess*
11	Mar 31	Physical and chemical properties of NAPL contaminants
	Apr 2	Movement of separate phase liquids
12	Apr 7	Movement of separate phase liquids (cont.)
	Apr 9	Site characterization methods
13	Apr 14	Overview of subsurface remediation technologies - pump and treat
	Apr 16	Treatment of the saturated zone - air sparging, soil flushing, reactive walls, thermal methods, soil stabilization
14	Apr 21	Remediation Case Histories – Chris Glenn
	Apr 23	Treatment of the vadose zone - vacuum extraction
15	Apr 28	Case History "
	Apr 30	Summary and Review
16	May 5	----
	May 7	----
17	May 14	Final Exam – 3-6 pm