UNIVERSITY OF MASSACHUSETTS AMHERST
Department of Civil and Environmental Engineering

CEE320 Soil Mechanics

Course Syllabus – Spring 2003

Instructor:
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Geotechnical Engineering Group
Room 20 Marston Hall
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Office Hours: MWF 9:00 to 10:00 and MW 11:00 to 12:00

Class Time and Location:
Lectures: MWF 10:10; Location: Marston Hall 15

Undergraduate Catalog Description:
Properties of soil used in engineering including: soil classification; compaction; swelling and shrinkage; permeability and seepage; consolidation; strength and stiffness; and implications of soil for civil engineering design.

Prerequisites/Corequisites:
CEE 241 Strength of Materials
CEE 357 Elementary Fluid Mechanics (corequisite)

Course Objective:
The objectives of Soil Mechanics are to introduce the student to the principles that govern the use and application of soil materials as an engineering material in Civil Engineering and for the student to gain proficiency in the classification and quantitative evaluation of soil engineering properties.

Course Format:
The course will be presented in three 50-minute lectures. The lectures will cover fundamental subjects presented in the textbook. There will be weekly assignments with exception of weeks when midterm examinations will be given. Two midterm examinations and one final examination will be given covering the subjects presented in class.

Course Outcomes:
Projected outcomes of the course are:
1. Ability to classify soil using fundamental properties.
2. Ability to evaluate compaction characteristics and interpret field compaction properties with respect to compaction specifications.
3. Ability to evaluate consolidation properties of soils and apply those properties to settlement problems frequently encountered in Civil Engineering.
4. Ability to evaluate stress conditions in soils, shear strength characteristics and determine limit equilibrium conditions for a given Civil Engineering problem.

Course Outcome Measures and Assessment:
Measures and assessment of the outcomes will be made by:
1. Weekly homework problem sets to provide feedback to the instructor on comprehension of lectures and reading assignments.
2. Two hour-long exams to provide feedback on the comprehension of soil mechanics principles.
3. One two-hour-long comprehensive exam to provide feed back on comprehension of soil mechanics principles.
4. Course and instructor evaluation to provide student feedback on the perceived quality of the course and effectiveness of the instructors.

Textbook:

Holtz, R.D. and Kovacs, W.D. (1981). *An Introduction to Geotechnical Engineering*. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

Grading:

1. Homework Assignments	15%
2. One-hour Exams (2@25%)	50%
3. Final Exam	35%

Assignments are to be submitted in class on the announced due date and will be graded on the basis of 10 points. Late assignments will be graded at a 50% deduction.

Academic honesty:
We operate on the assumption that all students are inherently honest, however we are cautious in this area. Any student observed perusing another student's work will not have his/her work graded. Any student who plagiarizes material is being academically dishonest. If this situation comes to our attention with sufficient evidence, we will not grade the report, homework or exam. The University Academic Honesty Policy applies and can be found in the undergraduate calendar. This policy covers plagiarism, cheating, fabrication, and facilitating dishonesty.

Email:
All students must send Professor DeGroot an email message by Monday February 3, 2003. Include your name, preferred email address and a brief statement of your background. Also include whether you have already taken or are currently taking CEE 365. I will use the email addresses to compile a class list, announce schedule changes, assign homework, etc. during the semester.

Lecture Outline and Reading Assignments

Topic	Reading Assignments
1. Introduction	Sections 1.1-1.7 & Appendix A
2. Index and Classification Properties - Phase Relationships - Soil Texture - Grain Size Distribution	Sections 2.1-2.8
3. Soil Classification - USCS System - AASHTO System	Sections 3.1-3.4
4. Clay Minerals and Soil Structure - Clay Mineralogy - Soil Structure and Fabric	Section 4.1-4.4 & 4.7-4.9
5. Compaction - Theory of Compaction - Field Compaction Control	Sections 5.1-5.4 & 5.6
6&7. Water in Soils - Capillarity - Darcy's Law - Permeability - Effective Stress	Sections 6.1-6.4 & 7.1-7.8
8. Consolidation - Compressibility - Consolidation - Settlement - Stress Distribution	Sections 8.1-8.7 & 8.12
9. Time Rate of Consolidation - Terzaghi's Theory of Consolidation - Coefficient of Consolidation	Sections 9.1-9.6
10. State of Stress and Soil Strength - Mohr Circle - Failure Theories - Mohr-Coulomb Failure Criterion	Sections 10.1-10.6
11. Shear Strength - Drained and undrained Strength of Sands - Drained and undrained Strength of Clays	Sections 11.1-11.5 & 11.9 (skip 11.9.10)