

CEE 762 Soil Mechanics II–Shear Strength

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Office Hours: M,W 3-3:50 pm have been reserved for this class; also available by appointment

Text: Advanced Soil Mechanics, B. Das, 2nd edition, Taylor & Francis, 1997.

Course Objective: To advance the student's knowledge concerning stress-strain relationships, failure theories, tests for shear strength of soils, and the shear strength of sands and clays. Various methods will be employed to meet these objectives including classroom lectures, laboratory experiments, homework, readings beyond the text, and the assignment of a graduate quality research paper. Emphasis will be placed on practical applications.

Approximate Grading Distribution:

Homework.....	40%
Research Paper.....	20%
Midterm Exam.....	20%
Final Exam.....	20%

Research paper: This paper is to be a reflection of your status as a graduate student and your desire to learn more about geotechnical engineering. This paper could well form the literature review for your thesis or project. You may even present the results of your own work here (laboratory, field, analysis, etc.) as a consultant. Plan on a minimum 20-page body of the report.

Topics for the paper should concern the shear strength of soil. The following subjects are appropriate (I welcome other suggestions, too):

Marine “quick” clays	Shear strength of weathered shale
Parameters for stability analyses	Field equipment for shear testing
Residual soils and colluvium	Slope failures in the Cincinnati area
Highly overconsolidated clays	Shear strength of coal refuse
Liquefaction	Shear strength of caliche
Soil behavior under repeated loads	Shearing resistance of soft clays

You must clear your topic with me. Approval will be given on a first-come, first served basis. Only one student may write a paper on a given subject.

The term paper will be due to me by 4 pm on Wednesday, March 10, 2004 (this is our last class period together).

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Syllabus for Winter Quarter 2004, page 2

Outline for the course:

<u>Week</u>	<u>Topic</u>	<u>Reading</u>
Jan 5,7	Stress at a point; stress-strain relationships and failure criteria; Mohr-Coulomb failure criterion	Ch. 3, 7.1-7.2
Jan 12,14	Stress paths, tests for the shear strength of soils	7.14, 7.3-7.7
Jan 21	Stress paths, tests for the shear strength of soils	
Jan 26,28	Shear strength of sands in both drained and undrained conditions; factors that affect the shear strength of sands; liquefaction and cyclic mobility behavior of saturated sands	
Feb 2,4	Pore pressure parameters—general derivation, meanings; effective and total stress analysis	4.1-4.6
Feb 9,11	Stress-deformation and strength characteristics of saturated cohesive soils; consolidated-drained behavior; Midterm exam	7.8-7.21
Feb 16,18	Consolidated-undrained behavior of saturated cohesive soils	
Feb 23,25	Unconsolidated-undrained behavior of saturated cohesive soils	
Mar 1,3	Stress paths during undrained loading of NC and OC clays; application of stress path to engineering problems	
Mar 8,10	Slope stability analyses; term papers due Wednesday, March 10 by 4 pm	
Mar 15	Final exam, Monday, 4-6 pm in our regular classroom	

