Syllabus
CE 512 Soil Mechanics II
Fall 2006

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Lecture: MWF 1:25 – 2:15pm
110 Walker

Office Hours: MW 2:15 – 4pm, or by appointment

ANGEL: https://cms.psu.edu/
The ANGEL system will be used for communication, postings, and other course-related items as the need arises.

**Class Notes and references provided during the semester will be the primary resources**

Reference Texts: The following items are held on reserve in the Engineering Library (325 Hammond Building) for CE 512:
- An introduction to geotechnical engineering / Robert D. Holtz, William
- Soil mechanics, SI version / T. William Lambe, Robert V. Whitman
- Soil mechanics (English units version) / T. William Lambe, Robert V. Whitman.

Course Evaluation

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Midterm</td>
<td>15%</td>
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<tr>
<td>Final Exam</td>
<td>25%</td>
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<tr>
<td>Project Report</td>
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<tr>
<td>Project Presentation</td>
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<tr>
<td>Homework</td>
<td>20%</td>
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Every student is responsible for upholding the academic integrity policy. For more information, see http://www.engr.psu.edu/CurrentStudents/acadinteg.asp
Course Goals

Evaluation of Engineering Properties of soils and Theoretical Analyses to predict behavior by:
1. Identifying the basic characteristics and properties of single particles and particle systems (e.g. soils)
2. Understand the steady-state flow of water through soils
3. Understand the concept of effective stress in soils
4. Understand stress-strain behavior of soils
5. Apply soil mechanics concepts to stability and settlement analyses

Course Topics

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<tr>
<th>Part</th>
<th>Topic</th>
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| I    | Introduction  
Failures, History of Geotechnical Engineering  
Materials and internal spatial scales |
| II   | Nature of Soil: Introductory Concepts  
soil formation and types, properties of a single particle; characteristics of particulate media, Phases and phase relations, index properties, classification systems |
|      | Coarse-grained soils  
packing and fabric |
|      | Fine-grained soils  
clay-water forces, interparticle forces, fabric |
| III  | Dry soil  
Mohr’s Circle, Stress Paths, Elastic Stress Distribution, stress-strain and strength behavior of sands, bearing capacity of sands, settlement of sands |
| IV   | Saturated Soil (No or Steady State Flow)  
Capillarity, effective stress principle, one- and two-dimensional flow, Coefficient of Permeability, Stress-strain and strength behavior of clays, drained shear behavior, strength principles, lateral earth pressure, slope stability and bearing capacity |
| V    | Saturated Soil (Transient Flow)  
Pore Pressure Parameters, Undrained Shear Behavior of Clays, Strength Principles, consolidation of fine-grained soils, evaluation of stability, settlement analysis |