CE 334 SOIL MECHANICS LABORATORY
Required Course
Spring 2009

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Course Data: Hours: ThThThTh 5678
             Room: Th5: M2181 Th678: Soil Mechanics Laboratory

Course Description (Catalog):
CE 334 Soil Mechanics Laboratory (0+0+2) 1
Basic laboratory experiments: specific gravity, Atterberg limits, grain size distribution, compaction,
permeability, consolidation, unconfined compressive strength, CBR, direct shear and triaxial compression
tests. Application of Principals treated in CE 332.

Course Objectives (Learning Outcomes):
To help students in understanding the soil mechanics concepts given in CE 332 Soil Mechanics course with
hands on experience
To be able to carry out all soil mechanics fundamental experiments according to standards.
To collect, analyze and interpret experimental data
To use communication skills to transfer their findings in a formal report format.
To have a feeling of engineering properties of geomaterials.

Textbook:

Reference Books:
“manual of soil laboratory testing” Vol 1, KH Head, ELE International Limited
“manual of soil laboratory testing” Vol 2, KH Head, ELE International Limited

Curricular Context:
This course reviews the basic theory of soil mechanics and describes the experiments which determine soil
properties in the laboratory.

Laboratory and Computer Usage:
Each lecture is followed by a laboratory session. Worksheet usage is recommended but not enforced.

Class Policies:
Laboratory: Each student is expected to conduct the experiments to gain hands on experience.
Attendance: Full attendance to lecture and laboratories is compulsory
Projects: There will be two projects, %40 of the course grade.
Midterm exam: One midterm exam, 30% of the course grade.
Final exam: Comprehensive exam at the end of the semester, 30% of the course grade.

Contribution of the Course to Program Outcomes:
(b) an ability to design and conduct experiments, as well as to analyze and interpret data.
(g) an ability to communicate effectively.
(k) An ability to use the techniques, skills and modern engineering tools necessary for engineering practice

Course Assessment:
The project given in the last month of the course is aimed to assess whether the students have understood
the fundamentals of soil mechanics laboratory.
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<td>Introduction and Orientation</td>
<td>Bardet CH 8</td>
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<td>To demonstrate safety issues in the laboratory</td>
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<td>2</td>
<td>Specific Gravity Test, Water Content Deter.</td>
<td>Bowles Exp 7; Bardet CH 1</td>
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<td>To familiarize the student with a general method of obtaining the specific gravity</td>
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<td>Grain Size Analysis</td>
<td>Bowles Exp 5-6; Bardet CH 1</td>
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<td>To introduce the student to the methods of making a mechanical and hydrometer grain-size analysis</td>
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<td>Atterberg Limit Tests, Classification</td>
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<td>Compaction Test &amp; Field Compaction Control</td>
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<td>Hydraulic Conductivity Test</td>
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<td>8</td>
<td>Consolidation Test</td>
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<td>To familiarize the student with a procedure for rapidly determining the strength parameters internal friction angle and cohesion for a soil</td>
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<td>Direct Shear Test</td>
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<td>To introduce the student to an approximate procedure for evaluating the shear strength of a cohesive soil.</td>
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<td>Unconfined Compression Test, CBR Test</td>
<td>Bowles Exp 14,19; Bardet CH 7</td>
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<td>To introduce the student to the basic procedure for determining the soil parameters internal friction angle and cohesion of a soil.</td>
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<td>Triaxial Test</td>
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<td>To introduce the student to the basic procedure for determining the soil parameters internal friction angle and cohesion of a soil.</td>
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<td>Triaxial Test: pore pressure measurement and dynamic parameters</td>
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<td>To present the basic procedures for obtaining pore-water pressure and/or volume changes during a triaxial shear test.</td>
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<td>Electronic measurement, data acquisition and experimental control techniques</td>
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<td>Laboratory Report</td>
<td>To familiarize the student with recent technologies in data acquisition and experiment control</td>
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