

CEE 477

Soil Mechanics Laboratory

- Catalog data:** 20-CEE-477. Soil Mechanics Laboratory 2 ug. cr. Laboratory exercises involving the engineering properties of soils and their measurement. A lab report is required for all projects (usually 7 of 10) unless stated by the instructor. Computer usage is stressed in the analysis and presentation of results.
- Prerequisites:** 20-ENFD-375 Strength of Materials,
20-ENFD-383 Fluid Mechanics,
15-GEOL-374 Geology for Engineers and Architects.
Co-requisite: 20-CEE-476 Principles of Soil Mechanics.
- Textbook:** Bowles, J.E., *Engineering Properties of Soil and Their Measurement*, 4th Edition, McGraw-Hill Book Co., New York, 1992 (with diskette).
- Reference:** None
- Coordinator:** Mark T. Bowers, PhD, PE, Associate Professor of Civil Engineering, 665 Baldwin Hall, 556-5425, Mark.Bowers@UC.Edu
- Goals:** To introduce practical and standard procedures for the determination of soil properties; to give the student an opportunity to present his/her findings in a written technical report; to introduce the use of geotechnical software for the analysis of laboratory data.
- Lecture or lab topics:**
1. Mechanical analysis, hydrometer analysis.
 2. Atterberg limits; visual classification of soils.
 3. Soil moisture-unit weight relationships.
 4. Determination of coefficient of permeability by falling head.
 5. Flow net workshop.
 6. Consolidation.
 7. Direct shear test on sand.
 8. Unconfined compression test on remolded samples.
 9. Sand cone determination of field unit weight.
 10. California bearing ratio
- Computer usage:** Weekly in the lab itself and in the writing of seven (7) laboratory reports on experiments conducted.
- ABET criterion 3:** a, b, e, g, k
- ABET criterion 8:** b, c
- Date prepared:** February 4, 2004

Specific Examples of ABET Criterion 3

- a The Soil Mechanics Laboratory course depends upon a solid background of the student in earth science, engineering mechanics, and fluid mechanics. Ten experiments are performed to prepare the student for practice in the field of geotechnical engineering as concerns soil identification and use.
- b Ten experiments are performed; the student is required to write a report on seven designated experiments. A major focus of the report is the interpretation of the data obtained by the student in the lab.
- e The student is taught how to solve for various geotechnical engineering parameters in the laboratory. The student is taught the mechanics of the procedures, the nuances of the testing, the ranges of expected results, rules-of-thumb, and interpretation thereof.
- g The goal of writing the reports is to help the student to communicate effectively. A clear, concise writing style is encouraged. The seven graded reports form an integrated package that the student can refer to in engineering practice.
- k The Soil Mechanics Laboratory is well-equipped with modern equipment. The ten laboratory experiments cover the basic skills required by a geotechnical engineering student entering consulting practice.