Course: CE 38100 – Soil Mechanics Laboratory

Type of Course: Required for Civil Engineering Program

Catalog Description: Performing various laboratory tests to determine the characteristics and mechanical properties of soil according to the procedures and standards set by the American Society for Testing and Materials (ASTM).

Credits: 1

Contact Hours: 3

Prerequisite Courses: None

Corequisite Courses: CE 38000 – Soil Mechanics

Prerequisites by Topics: None


Supplemental Materials: Annual Book of ASTM Standards; American Society for Testing and Materials. Recent copies are in placed in the reference section in Walter E. Helmke Library

Course Objectives: Students will able to identify physical and mechanical properties of soil in the field and laboratory settings. Student will be familiar with ASTM laboratory test standards and procedures. This include preparing soil samples for testing, performing the test, collecting and analyzing data, interpreting the results and writing technical reports.

Course Outcomes: Students who successfully complete this course will be able to:
1. Perform common soil tests to identify physical and mechanical properties of soils. [5, 6]
2. Be familiar with soil mechanics tests and determines which test is needed in designing civil engineering projects and/or solving engineering problems. [1, 6, 7]
3. Prepare soil samples for testing, performing the test, collecting and analyzing data according to ASTM. [6, 7]
4. Apply the laboratory results to problem identification, quantification, and basic soil mechanics related design problem. [2, 6, 7]
5. Demonstrate the ability to write clear technical lab reports. [3, 5]
6. Use word processors and other modern software packages in writing and finishing the report. [3, 7]
7. Demonstrate the ability to work in groups. [5]
8. Understand and apply ethical issues associated with decision making and professional conduct in the lab and field environment. [4]

6. Lecture Topics
1. Orientation, introduction, lab safety, sampling procedure
2. Moisture Content Determination
3. Organic Matter (Content)
4. Unit Weight (Density)
5. Specific Gravity of Soil Solids
6. Atterberg Limits
7. Grain Size Distribution- Sieve Analysis
8. Grain Size Distribution- Hydrometer Analysis
9. Moisture-Density Relationship (Compaction Test)
10. Hydraulic Conductivity- Constant Head Method
11. Basic Classification of Rocks- Geology Lab.
12. Demonstration of In-Place Soil Density
13. Demonstration of other lab such as Boring Logs and Soil Profiles Preparation.
14. Final Exam

Computer Usage
Medium

Laboratory Experience
High

Design Experience
Low

Coordinator
Fawad S. Niazi, Ph.D.

Date
July 1, 2018