

CE 6421 Laboratory Characterization of Geomaterials – Fall 2015

Course overview: This course is designed to provide instruction in test procedures, calibration, data acquisition, interpretation, and apparatus limitations/influences for geotechnical laboratory index, permeability, consolidation and strength tests. Instruction is provided in topics ranging from specimen preparation, membrane effects, specimen saturation, incremental and constant rate consolidation, triaxial, direct and interface shear and small/large strain dynamic testing. Laboratory sessions provide the opportunity to examine these issues and to perform tests. The emphasis in the lab work is not just on obtaining results but on understanding the potential error sources for each test and interpreting the test results. Results of more complex tests are correlated with those of simpler index tests.

Instructor: J David Frost, Mason 2285; Phone: 404-894-2280; david.frost@ce.gatech.edu

GTA: Alejandro Martinez, Mason 2131C; Phone: 512-504-6126; amartinez32@gatech.edu

Class Schedule: MW, 9:00 am to 10:00 pm, Mason 1132

Lab Schedule: F, 8:00 am to 11:00 am, and other times as required, Mason Room 1132;

Texts: No required textbook however several texts are useful for selected tests including:

- Soil Testing for Engineers, T.W. Lambe, Bi-Tech Publishers, Reprinted: 1992
- Fundamentals of Soil Behavior, J.K. Mitchell and K. Soga, Wiley, 3rd edition, 2005
- Geotechnical Laboratory Measurements, J.T Germaine and A.V. Germaine, Wiley, 2009

Additional References: Lists of references given for each topic

Exams: (a) Mid-term exam, 1 hr, Friday Oct. 9th, 9:00 am to 10:00 am

(b) Final exam, 3 hrs, Friday Dec. 11th, 8:00 am to 11:00 am

(c) Project oral reports, Friday Dec. 4th, 8:00 am to 11:00 am

Assessment: (a) Midterm Exam - 10 %

(b) Final Exam - 30 %

(c) Lab Reports - 40 %

(d) Group project written/oral report - 20 % (written - 10%, oral - 10%)

Lecture and Laboratory Modules:

Index Testing – 4 weeks

Compaction Control – 1 week

Hydraulic Conductivity – 1 week

Consolidation – 2 weeks

Strength – 4 weeks

Interfaces – 2 weeks

Dynamic Testing – 1 week