

CEE 6421 Syllabus

Laboratory Characterization of Geomaterials

Fall, 2026

Instructor Information

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General Course Information

Description

This course is designed to provide instruction in test procedures, calibration, data acquisition, interpretation, and apparatus limitations/influences for a range of laboratory soil index, permeability, consolidation and strength tests as well as selected laboratory geosynthetic index, permeability 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 strength testing, small/large strain dynamic testing, geosynthetic index, strength and creep testing. Laboratory sessions provide the opportunity to examine these issues and to perform selected tests. Results of more complex tests are correlated with those of simpler index tests.

Course Learning Outcomes

The emphasis in the lab work associated with the course is not just on obtaining results but on:

- 1) Understanding the standard guidelines for performing tests
- 2) Understanding the potential error sources for each test
- 3) Interpreting the test results
- 4) Presenting the test results in written and oral formats

Required Course Materials

1. 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
 - Designing with Geosynthetics (2 Vols), R.M. Koerner, 6th edition, Xlibris Press, 2012

Grading Policy:

- a) Midterm exam - 15 %
- b) Final exam - 35 %
- c) Group lab reports - 35 %
- d) Project group report - 15 % (written - 10%, oral - 5%)

Description of Graded Components

Both mid-term and final exams are open-book format. The focus is on comprehension of concepts, not memorization of specifics.

The mid-term exam will be a 50-minute exam given during a regular class period

The final exam will be a 2 hour and 50-minute exam given during the scheduled time period of exam week for the class.

Lab reports will be prepared and submitted as group reports (2 to 3 person groups) for grading by the course GTA.

The mid-term and final exams are graded by the instructor.

The Term project written/oral reports consists of an oral presentation of a slide deck prepared by the group and delivered during the final class period.

Course Policies

Attendance and/or Participation

Attendance is expected in the course so that concepts are fully and appropriately understood by all students enrolled. This is critical given the fact that lab exercises are conducted in group as opposed to individual format,

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review [Georgia Tech's Honor Code](#) and the student [Code of Conduct](#).

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Core IMPACTS

[Core IMPACTS](#) is the University System of Georgia's General Education curriculum. If you are teaching a course that counts towards Core IMPACTS, you should include a syllabus statement about the Core area and associated [career competencies](#). [This resource](#) developed by the Center for Excellence in Teaching and Learning and Online Education at Georgia State University includes template syllabus statements for each of the Core IMPACTS areas that you may adapt for your course.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, [contact the Office of Disability Services](#) (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. [The Student-Faculty Expectations](#) articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Campus Resources for Students

Graduate Student Academic and Professional Success Resources:

A list of resources for graduate students is given on the [Office of Graduate and Postdoctoral Education](#) website. Specific information for [current graduate students](#) includes

- [Academic Resources](#) such as the Communications Center, Language Institute, Library, Catalog, Registrar, resources for conducting research, Advocacy and Conflict Resolution resources, and how to manage unexpected situations that may impact your academic performance;
- [Student Resources](#) such as Campus Services, Child Care/Family programs, Health & Wellness, Career Services, and the Student Resource Guide; and
- [Professional Development](#) such as the programming from the Career Center and other professional development resources and events”

Student Well-Being:

At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A [comprehensive list](#) of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being ([student-resource-guide \(gatech.edu\)](#))