CIVE.5370 EXPERIMENTAL SOIL MECHANICS
SPRING 2016
M - 6:30-9:20 PM in KI-302

Instructor: Edward L. Hajduk, D.Eng, PE
Lecturer
Office Location: PA105D
E-Mail: Edward_Hajduk@uml.edu
Office Hours: See office door or website. Also by appointment.

Prerequisite: Permission of Instructor
Corequisite: None

Textbook: None.

Suggested Textbooks (available in PA105C):

- *Geotechnical Laboratory Measurements for Engineers*, J.T. Germaine and A.V. Germaine (John Wiley & Sons)
- *Experimental Soil Mechanics*, J.P. Bardet (Prentice-Hall)

Supplemental Course Material (Available via UMass Lowell Library, Course Website, or Internet):

- ASTM Volume 04.08 Soil and Rock (I): D420-D5876
- *Federal Highway Administration (FHWA) GT-15 Geotechnical Differing Site Conditions*
- *Federal Highway Administration (FHWA) IF-02-034 Evaluation of Soil and Rock Properties*
- *Federal Highway Administration (FHWA) NHI-01-031 Manual on Subsurface Investigations*
- *Federal Highway Administration (FHWA) NHI-06-088 Soils and Foundations - Volume I*
- *Federal Highway Administration (FHWA) NHI-06-089 Soils and Foundations - Volume II*
- *Naval Facilities Engineering Command (NAVFAC) Design Manual 7.01 Soil Mechanics*
- US Army Corp of Engineers Engineering Manual EM 1110-1-1904 Settlement Analysis
- United States Army Field Manual FM5-410 Military Soils Engineering

Additional Course Material (e.g. lecture slides): as determined by Instructor.

Course Description
This course is designed to give students a comprehensive understanding of various laboratory tests for evaluating engineering soil properties (needed for the analysis and design of geotechnical systems). The various tests covered in this course may be grouped in the following five categories: soil classification; density & compaction; permeability & seepage; consolidation; and shear strength. The course involves studying the underlying principles, equipment, experimental procedure, and data processing. This is followed by hands-on experience in conducting the tests, interpretation of test results, evaluation of soil properties, and presentation.

Basis of Course Grade:
Individual course grades are determined as follows with the subsequent grading breakdown:

\[
Grade(\%) = \frac{\sum (Total \ Points \ Earned \ including \ extra \ credit)}{\sum (Total \ Points \ Possible \ not \ including \ extra \ credit)} \times 100
\]

- 93% ≤ A
- 90% ≤ A- < 93%
- 87% ≤ B+ < 90%
- 83% ≤ B < 87%
- 80% ≤ B- < 83%
- 77% ≤ C+ < 80%
- 73% ≤ C < 77%
- 70% ≤ C- < 73%
- 67% ≤ D+ < 70%
- 65% ≤ D < 67%
- F < 65%
Grades will be dependent on your work and performance. Grading will NOT be conducted on a curve; it is theoretically possible for the whole class to earn an A or an F.

Assignment guidelines are provided in a separate handout. Weekly assignments (when given) will be worth one hundred (100) points. Laboratory reports will be worth two hundred (200) points each. There is no final exam for this course. **Students have one week after the return of assignments and laboratory reports to discuss grading with the Instructor.**

Assignments and lab reports will have 20% late penalty deduction from the earned points for each day past the assignment/report due date unless an extension is granted by the Instructor. Note the assignment due date will be determined by the Instructor and told to students in class the day the assignment is given. Any assignment extensions will also be told to students in class and/or via email. For example, an assignment due on a Friday is turned in the following Monday. The student earned a grade of 82/100 points for the assignment. The assignment is three days late (Saturday is 1 day late, Sunday is 2 days late, Monday is 3 days late). 20% of 82 points is 16.4 points, times 3 equals 49.2 points. The final assignment grade = 82 - 49.2 = 32.8 points.

Everyone makes mistakes: no one is perfect. If the Instructor makes a mistake in class and you are the first to notify him during that class, you are eligible for two (2) extra credit points towards your assignment grade. To receive these extra credit points, you must email the Instructor within one (1) day of noting the mistake. The email should have the course number in the Subject Field and you need to summarize the mistake and state the solution within the body of the email (e.g. “the equation in Slide 4 on your lecture notes on 9/2/15 was F=me. The equation should have been F=ma).

**Honor and Ethics:**

Engineers have a trust placed on them by society to ensure that the public safety is held paramount. People constantly depend on engineers to provide safe bridges, buildings, drinking water, etc. **This trust must not be violated.** For this reason, no form of academic dishonesty will be tolerated in this class. Students are encouraged to work together on homework assignments and class projects (if assigned). However, any evidence of direct copying of a homework assignment will result in a zero grade for that assignment for all students involved. Any evidence of academic dishonesty during a weekly test or the final exam will also result in a zero grade for that assignment for all students involved. Refer to the University of Massachusetts Lowell’s Academic Integrity Policy for additional details, which can be found at this URL: (http://www.uml.edu/Catalog/Undergraduate/Policies/Academic-Policies/Academic-Integrity.aspx)
You must cite and acknowledge all people and sources used in your work. Students submitting academic work for an individual grade are individually held to not plagiarize. Plagiarism is defined as representing the words or ideas of another as one's own work in any academic exercise. Materials from outside sources must be documented using the American Society of Civil Engineers (ASCE) Author-Date format. This reference system can be found within the ASCE E-Books Publishing in ASCE Journals: A Guide for Authors (http://ascelibrary.org/doi/book/10.1061/9780784479018) or Publishing Books with ASCE: A Guide for Authors, Editors, and Committees (http://ascelibrary.org/doi/book/10.1061/9780784478998).

Attendance:
The University of Massachusetts – Lowell’s Policy on Class Attendance is in effect for this course. This policy can be found at this URL: http://www.uml.edu/Catalog/Undergraduate/Policies/Academic-Policies/Attendance-Policies.aspx

Classroom Demeanor:
The expectation for students to participate as engineering professionals is implicit. In addition, no active cell phones, pagers, or sound or image recording devices shall be allowed in the classroom.

Email Policy:
When required, I will send class information to students via email using the Student Information System (SiS) system. SiS sends emails to your UML student email address. Every student who registers for courses at the University of Massachusetts – Lowell receives a UML student email address. Students are responsible for checking this email account for messages from the Instructor for this course.

Academic Support:
Please contact me privately if you need accommodations because of a disability. The University’s Policy for Students with Disabilities will be followed for this course. This policy can be found at http://www.uml.edu/student-services/Disability/Policies.aspx.
Tentative Course Schedule:

<table>
<thead>
<tr>
<th>Class</th>
<th>TOPIC(S)</th>
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</thead>
<tbody>
<tr>
<td>1 (1/25)</td>
<td>Introduction/Review of Subsurface Exploration (Lecture)</td>
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| 2 (2/1) | Soil Sampling & Soil Classification Review (Lecture)  
  - Sample Disturbance  
  - Statistical & Error Analysis in Geotechnical Engineering  
  - Sample Preparation  
  - Soil Classification Review  
  - Sample Preparation Review |
| 3 (2/8) | Sample Preparation (Laboratory) |
| 4 (2/16) | Soil Classification (Laboratory)  
  - Sieve Analysis  
  - Hydrometer Analysis  
  - Atterberg Limits (LL & PL)  
  - Specific Gravity |
| 5 (2/22) | Soil Permeability (Lecture) |
| 6 (2/29) | Soil Permeability (Laboratory)  
  - Constant Head  
  - Falling Head |
| 7 (3/7) | 1D Consolidation (Lecture)  
  **Week of 3/14 – Spring Break** |
| 8 (3/21) | 1D Consolidation (Laboratory) |
| 9 (3/28) | Shear Strength (Lecture) |
| 10 (4/4) | Shear Strength – Direct Shear (Laboratory) |
| 11 (4/11) | Shear Strength – Triaxial (Laboratory)  
  **Week of 4/18 – Monday Patriot’s Day.** |
| 12 (4/25) | Makeup Lab (if needed) |