EXPANDED COURSE DESCRIPTION
CIVIL ENGINEERING
Lassonde School of Engineering
Civil Engineering
LE / CIVL 3110 3.0 SECTION A
SOIL MECHANICS
FALL 2019 / WINTER 2020

Last Modified Date: 08/07/2019

COURSE CALENDAR DESCRIPTION

The course presents essential topics in soil mechanics, including the origin and nature of soils, soil identification and classification, compaction, seepage theory, groundwater flow nets, stresses and strains in soils, effective stress concept, consolidation, shear strength of soils, and earth pressure theory. Emphasis is on learning of fundamental soil mechanics concepts using examples of their application to geotechnical engineering. Laboratory practicum component of the course provides hands-on experience of laboratory tests that are commonly used for determination of physicochemical and engineering properties of soils.

Prerequisites: LE/CIVL 2160 3.00, LE/CIVL 2210 3.00 or LE/CIVL 2210 4.00, LE/CIVL 2220 3.00 or LE/CIVL 2220 4.00.

INSTRUCTOR(S)

<table>
<thead>
<tr>
<th>Name</th>
<th>Section / Format / Term</th>
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ADDITIONAL INFORMATION

Textbook

Course Website

Course Learning Outcomes

Upon completing this course, the students should be able to:
1. Determine index properties of soils and use them to identify, describe and classify soils.
2. Understand the effective stress concept.
3. Understand the effect of seepage on ground behaviour.
4. Determine the magnitude and distribution of stresses and pore-water pressure in the ground.
5. Use Coulomb’s friction law and dilatancy to describe the shear strength of soils.
6. Understand drained and undrained behaviour of soils.
7. Use Rankine and Coulomb theories to determine the magnitude and distribution of earth pressures on retaining walls
8. Specify, conduct and interpret soil tests to obtain compaction, permeability, shear strength and consolidation characteristics of soils.

Lecture topics
1. Identification, index properties, and classification of soils
2. Mass-volume relationships
3. Soil compaction
4. Seepage
5. Stresses and strains in soil
6. The principle of effective stress
7. One-dimensional consolidation settlements
8. Time rate of consolidation
9. Shear strength of soils
10. Drained and undrained behaviour of soils
11. Earth pressure theory

[Depending on the flow of the course, the topics may be subject to minor changes.]

**Laboratory Sessions**
1. Visual Identification and Grain-size Distribution
2. Atterberg Limits
3. Compaction
4. Permeability
5. Consolidation
6. Shear Strength

**Examinations**
There will be three term tests and one final examination. The dates for the three term tests are: Term Test #1: Mon Sep 30; Term Test #2: Fri Oct 25; Term Test #3: Fri Nov 22. All the term tests will be of 45-minute duration and will be conducted in LSB 105 unless announced otherwise. The date, time, and location of the final examination will be announced on the course’s York Moodle website.

**In-class Quizzes**
There will be 12 in-class quizzes (1 quiz every week), each of up to 15-minute duration and comprising multiple-choice, true-false, and short numerical questions. These in-class quizzes will be given either at the beginning, in the middle, or toward the end of a lecture and will be based on the course material covered before the date of the quiz. There will be no prior announcement of these quizzes. As such, students should expect and come prepared to write these quizzes during every lecture. Attendance will be taken in the lecture in which a quiz is given. Every student is expected to participate in and complete all in-class quizzes. A student’s average mark for in-class quizzes will be computed by adding the marks received from the quizzes written by the student and dividing the sum by 12. [For example, if a student wrote 9 out of 12 quizzes and had marks of 100, 80, 90, 70, 40, 100, 60, 90, and 90, the student’s average mark would be (100+80+90+70+40+100+60+90+90)/12 = 60.] This average mark will be worth 18% of the final mark for the course. That is, an average mark of 60 will contribute 60 x 0.18 = 10.8 marks to the final mark for the course. In addition, participation marks will be added to the student’s final mark for the course as per the following:
- < 6 quizzes written - 0 participation marks
- 6 to 10 quizzes written - 1 participation mark
- > 10 quizzes written - 2 participation marks

There will be no in-class quizzes on Mon Sep 30, Fri Oct 25, and Fri Nov 22 because of the scheduling of the term tests on these days.

**Lecture Notes and E-learning Content**
Lecture notes, supplementary materials, lab handouts, practice problems and their solutions, and e-learning content will be posted on the course’s York Moodle website. Students are strongly advised to visit this website frequently for latest course news, announcements and updates. Students are advised to contact the course instructors or TAs as soon as possible in case of difficulties in accessing the e-learning materials.

**Lab Report Submission**
It is important for the students to complete their lab reports on time in order to obtain satisfactory academic performance. Lab reports can only be submitted in electronic form (e.g. scanned PDF file) via the course’s York Moodle website. Paper submission will only be accepted under extenuating circumstances at the discretion of the instructors and/or TAs. Lab reports submitted after the due date will be subject to marks deduction at a rate of 20% marks per day of delay. Failure to submit a lab report 5 days after the lab report’s due date will be taken as failure to complete that particular lab, resulting in the assigning of an INCOMPLETE grade for the course.
Evaluation Scheme
- Lab Reports (6 reports in total) - 12%
- In-class Quizzes - 18%
- Term Tests (3 tests; 10% each) - 30%
- Final Examination - 40%

[The student must obtain overall marks of 50% or more in order to pass the course.]

ACADEMIC INTEGRITY LINKS
- Senate Policy on Academic Honesty - http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/
- Academic Integrity - http://lassonde.yorku.ca/academic-integrity

STUDENT LINKS
- Student Rights and Responsibilities - http://oscr.students.uit.yorku.ca/student-conduct
- Religious Observance - https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs
- Student Accessibility Services (SAS) - https://accessibility.students.yorku.ca/
- York University’s Policies on Gender/LGBTQ*/Positive Space - http://rights.info.yorku.ca/lgbtq/

LAND ACKNOWLEDGEMENT
- We acknowledge our presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, the Huron-Wendat, and the Métis. It is now home to many Indigenous Peoples. We acknowledge the current treaty holders, the Mississaugas of the New Credit First Nation. This territory is subject of the Dish With One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.
- The Indigenous Framework for York University: A Guide to Action can be found here: http://indigenous.info.yorku.ca/
- Meaning of a land acknowledgement: http://healthydebate.ca/opinions/indigenous-land-acknowledgements

Many courses utilize Moodle, York University's course website system. If your course is using Moodle, click here to access it.

Moodle @ York University