ENGG*3670 SOIL MECHANICS

SCHOOL OF ENGINEERING, UNIVERSITY OF GUELPH

FALL 2011

COURSE DESCRIPTION

Soil Mechanics is the branch of science that deals with the study of the physical properties of soil and the behavior of soil masses subjected to various types of forces. In this course we will study relations of soil physical and chemical properties to strength, visco-elastic property and pressure-volume relationships of soil systems, stress-strain characteristics of soil, environmental engineering applications of soil mechanics and field investigation methods.

INSTRUCTOR

Dr. Bahram Gharabaghi, THRN 2417, 519-824-4120 x 58451, bgharaba@uoguelph.ca
Homepage: http://www.soe.uoguelph.ca/faculty_pages/bahram_g.html

LABORATORY MANAGER

Ryan Smith, THRN 1177, 519-824-4120 x 53278, rsmith17@uoguelph.ca

OFFICE HOURS

- Monday, 4:30 PM - 5:00 PM, THRN 2417; and
- Tuesday, 4:00 PM - 4:30 PM, THRN 2417.

COURSE RESOURCES

- Lectures
  - Monday, Wednesday and Friday, 11:30 AM - 12:20 PM, MACK 121
- Laboratory Experiments
  - Section 101: Tuesday, 11:30 AM - 1:20 PM, FVMI 135;
  - Section 102: Wednesday, 03:30 PM - 5:20 PM, FVMI 135; and
  - Section 103: Wednesday, 12:30 PM - 2:20 PM, FVMI 135.

REQUIRED TEXTBOOKS

1. Donald P. Coduto, Man-chu Ronald Yeung, William A. Kitch. **2010**. Geotechnical Engineering: Principles & Practices; Prentice Hall; ISBN- 978-0132368681; and
2. Cheng Liu and Jack B. Evett. **2009**. Soil Properties, Testing, Measurement, and Evaluation. Pearson Prentice Hall. ISBN 0-13-614123-4.

COURSELINK

Students must access course website on a weekly basis to download course material and to upload student work such as the weekly laboratory experiment technical reports electronically to the course "Dropbox" under the designated folders: https://courselink.uoguelph.ca/shared/login/login.html

TOPICS OF STUDY

Week	Date	Lecture Topics
1	Sep. 12 to 16	Site Exploration and Characterization (3)
2	Sep. 19 to 23	Soil Composition (4)
3	Sep. 26 to 30	Soil Classification (5)
4	Oct. 3 to 7	Groundwater (7 & 8)
5	Oct. 11 to 14	Excavation, Grading and Compacted Fill (6)
6	Oct. 17 to 21	Stress in a Soil Mass (9)
7	Oct. 24 to 28	Compressibility and Settlement (10)
8	OC. 31 to Nov. 4	Rate of Consolidation (11)
9	Nov. 7 to 11	Soil Strength (12)
10	Nov. 14 to 18	Stability of Earth Slopes (13)
11	Nov. 21 to 25	Lateral Earth Pressures (17)
12	Nov. 28 to Dec. 1	Earth Retaining Structures (16)

LEARNING OUTCOMES

- Knowledge of the basic properties of soil;
- Understanding mechanical behavior of soil materials;
- Knowledge of environmental engineering applications of soil mechanics; and
- Familiarity with standard laboratory and field methods of soil analysis.

MIDTERM TEST

Midterm test is scheduled for **Mon. Oct. 17th, 19:00 to 22:00 CRSC 116** and is worth 20%.

IN-CLASS QUIZZES

Following the midterm test, there will be a series of in-class quizzes, each worth 2% of the final grade for up to a total of 10% of the final grade; each student may choose to write more than 5 quizzes, however, only the top 5 marks will be considered.

LABORATORY EXPERIMENTS

Students will form groups of 3 students and collaborate in conducting the experiments, taking notes, and discussions; however, each student will write and submit a separate individual report. If a student cannot attend a laboratory experiment on scheduled time for valid reasons, the student should contact the instructor and arrange to conduct the missed experiment during the Open Lab week (i.e. Nov. 29th or 30th).

Each student must prepare individually a technical report for each completed experiment ***due within one week of the date of the experiment*** and submit both electronically on the CourseLink "Dropbox" designated folder as well as in hard copy to the course instructor by the due date, worth 2% each. Late submissions (without valid reasons approved by the instructor) will have a penalty of 25% per day.

A nicely formatted and professional "Final Laboratory Engineering Soils Report" of all completed laboratory experiments must be submitted by each student individually, both electronically on the CourseLink "Dropbox" designated folder as well as in hard copy by the due date of **Thursday December 1st by noon** (i.e. during the lecture) worth 20% of the total mark. Please note late submissions (without valid reasons approved by the instructor) will have a penalty of 25% per day.

Week	Date	Activity	Location
1	Sep. 12 to 16	Lab 1: Standard Procedures	FVMI 135
2	Sep. 19 to 23	Lab 2: Grain Size Analysis	FVMI 135
3	Sep. 26 to 30	Lab 3: Hydrometer Analysis	FVMI 135
4	Oct. 3 to 7	Lab 4: LL, PL and SL Analysis	FVMI 135
5	**Oct. 11 to 14**	**Tutorials for the Midterm Test**	**TBA**
6	**Oct. 17 to 21**	**Lab 5: SEEP-W Software**	**THRN 1313**
7	Oct. 24 to 28	Lab 6: Permeability Test	FVMI 135
8	**OC. 31 to Nov. 4**	**Lab 7: CTRAN-W Software**	**THRN 1313**
9	Nov. 7 to 11	Lab 8: Compaction Test	FVMI 135
10	Nov. 14 to 18	Lab 9: Direct Shear Test	FVMI 135
11	**Nov. 21 to 25**	**Lab 10: SLOPE-W Software**	**THRN 1313**
12	Nov. 28 to Dec. 1	Open Lab	FVMI 135

EVALUATION

The final grade will be determined from the results of the Laboratory Experiment Technical Memorandums, Final Laboratory Engineering Soils Report, Midterm Test, In-Class Quizzes, and the Final Examination weighted as follows:

1. Laboratory Experiment Technical Reports……..20%
2. Final Laboratory Engineering Soils Report……20%
3. Midterm Test ……20%
4. Top 5 in-Class Quizzes……..10%
5. Final Examination……..……...……30%

POLICY FOR MISSED EXAMINATION

If the Final Examination is not written, the procedures in the current University of Guelph Undergraduate Calendar must be followed.

PLEASE NOTE

The regulations concerning academic misconduct as outlined in the current University of Guelph undergraduate calendar will be strictly enforced.