

# ENGG\*3670 SOIL MECHANICS

## SCHOOL OF ENGINEERING, UNIVERSITY OF GUELPH

### FALL 2007

#### **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 2386, 519-824-4120 x 58451, [bgharaba@uoguelph.ca](mailto:bgharaba@uoguelph.ca)  
Homepage: [http://www.soe.uoguelph.ca/faculty\\_pages/bahram\\_g.html](http://www.soe.uoguelph.ca/faculty_pages/bahram_g.html)

#### **LABORATORY MANAGER**

John Whiteside, THRN 1107, 519-824-4120 x 54424, [jwhitesi@uoguelph.ca](mailto:jwhitesi@uoguelph.ca)

#### **OFFICE HOURS**

You are welcome visit at your convenience and/or send me an email to book an appointment.

#### **COURSE RESOURCES**

- Lectures
  - Tuesday and Thursday, 8:30AM - 9:50AM, CRSC, Room 116
- Laboratory
  - Section 101: Wednesday 01:30PM - 03:20PM, THRN 1109,
  - Section 102: Thursday 01:30AM - 03:20AM, THRN 1109, and
  - Section 103: Wednesday 03:30PM - 05:20PM, THRN 1109.

#### **REQUIRED TEXTBOOKS**

1. Braja M. Das. 2005. Fundamentals of Geotechnical Engineering; Thomson Learning; ISBN: 0-534-49294-0; and
2. Joseph E. Bowles. 1992. Engineering properties of soils and their measurement. McGraw-Hill. ISBN 0-07-911266-8.

## TOPICS OF STUDY

Week	Date	Lecture Topics
1	Sep. 10 to 14	Soil Deposits and Grain-Size Analysis
2	Sep. 17 to 21	Weight-Volume Relationships
3	Sep. 24 to 28	Soil Compaction
4	Oct. 1 to 5	Hydraulic Conductivity and Seepage
5	Oct. 8 to 12	Stress in a Soil Mass
6	Oct. 15 to 19	Consolidation
<b>7</b>	<b>Tuesday Oct. 30</b>	<b>Midterm Test (8:30AM - 9:50AM)</b>
8	Oct. 29 to Nov. 2	Shear Strength of Soil
9	Nov. 5 to 9	Slope Stability
10	Nov. 12 to 16	Subsurface Exploration
11	Nov. 19 to 23	Lateral Earth Pressure
12	Nov. 26 to 30	Retaining Walls and Braced Cuts

## 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.

## LABORATORY EXPERIMENTS

Students will form groups of 2 to 3 students and collaborate in conducting the experiments, taking notes, discussions, and writing a report. The reports are due within one week of the date of the experiment. If a student can not attend a laboratory experiment on scheduled time for medical reasons, the student should contact the instructor and arrange to conduct the experiment during the Open Lab week (Nov. 12 to 16).

## EVALUATION

The Final Examination is optional for any student who obtains a mark of 50 or more out of 100 on the Mid-term examination. The examination portion of the composite mark will be based on the Mid-term mark unless the student has written the Final Examination and obtained a mark higher than on the Mid-term.

A student who does not obtain a passing mark (50 or above out of 100) on the Mid-term examination must write the Final examination. Any student who has a mark less than 50 out of 100 on both Midterm and Final examinations will be assigned, as the mark for the course, the mark obtained on the Final examination.

For the students who obtain a passing mark on Midterm or Final examination, the final grade will be determined from the results of the Final examination, Midterm test, In-class presentation, two quizzes and laboratory experiments weighted as follows:

Week	Date	Activity	Room	Mark
1	Sep. 10 to 14	Lab 1: Introduction	THRN 1109	-
2	Sep. 17 to 21	Lab 2: Grain Size Analysis	THRN 1109	5%
3	Sep. 24 to 28	Lab 3: Hydrometer Analysis	THRN 1109	5%
4	Oct. 1 to 5	Lab 4: LL, PL and SL Analysis	THRN 1109	5%
5	Oct. 8 to 12	Lab 5: SEEP-W Software	THRN 1109	5%
6	Oct. 15 to 19	Lab 6: Tutorial & Quiz 1	TBA	5%
<b>7</b>	<b>Oct. 30</b>	<b>Midterm Test</b>	<b>Mack. 232 &amp; 238</b>	<b>50% or 0%</b>
8	Oct. 29 to Nov. 2	Lab 7: Compaction Test	THRN 1109	5%
9	Nov. 5 to 9	Lab 8: Permeability Test	THRN 1109	5%
10	Nov. 12 to 16	Lab 9: Open Lab	THRN 1109	-
11	Nov. 19 to 23	Lab 10: SLOPE-W Software	THRN 1109	5%
12	Nov. 26 to 30	Lab 11: Tutorial & Quiz 2	TBA	5%
	<b>TBA</b>	<b>Final Examination</b>	<b>TBA</b>	<b>0% or 50%</b>
1-12	Sep. 11 to Dec. 1	In-Class Presentation	CRSC 116	5%
		Total		100%

## PROBLEM ASSIGNMENTS

A few problems of each chapter are recommended for your weekly assignments. They will not be submitted and no grade will be assigned for their completion. However, each group is responsible for presenting the solution for one problem set (as shown in the table below) in the class. A total of 5 marks is assigned for this task. The content of the oral presentations will be evaluated based on evidence of knowledge of the subject, correct solution of the problems and the ability to effectively respond to the questions from the audience.

Week	Date			Assigned Problems	Group No.
	Day	Month	Day		
2	Tuesday	SEP	18	2.1, 2.5, 2.7	1
	Thursday	SEP	20	2.15, 2.17, 2.19	2
3	Tuesday	SEP	25	3.1, 3.3, 3.5	3
	Thursday	SEP	27	3.7, 3.9, 3.11	4
4	Tuesday	OCT	2	4.1, 4.4, 4.7	5
	Thursday	OCT	4	4.15, 4.16, 4.17	6
5	Tuesday	OCT	9	5.1, 5.3, 5.5	7
	Thursday	OCT	11	5.17, 5.18, 5.19	8
6	Tuesday	OCT	16	6.1, 6.4, 6.5	9
	Thursday	OCT	18	6.10, 6.21, 6.25	10
7	Tuesday	OCT	23	7.1, 7.2, 7.3	11
	Thursday	OCT	25	Review	-
8	Tuesday	OCT	30	Midterm Test	-
	Thursday	NOV	1	7.17, 7.20, 7.23	12
9	Tuesday	NOV	6	8.1, 8.2, 8.3	13
	Thursday	NOV	8	8.17, 8.23, 8.24	14
10	Tuesday	NOV	13	9.2, 9.4, 9.5	15
	Thursday	NOV	15	9.10, 9.11, 9.12	16
11	Tuesday	NOV	20	11.1, 11.2, 11.3	17
	Thursday	NOV	22	11.22, 11.23, 11.24	18
12	Tuesday	NOV	27	13.1, 13.2, 13.3	19
	Thursday	NOV	29	13.4, 13.5, 13.6	20

**BLACKBOARD**

Some of the lecture notes and course material will be made available on Courselink:  
<http://courselink.uoguelph.ca/ce6courselink/index.html>

**POLICY FOR MISSED EXAMINATION**

- If the Midterm Test is not written at the scheduled time, written medical or other documentation must be provided.
- 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 University of Guelph, Undergraduate Calendar for 2007 will be strictly enforced.