

Department of Civil and Environmental Engineering
CE 3510: Soil Mechanics I

<u>Instructor:</u> Maria Chrysochoou	<u>Date:</u> Fall 2017
<u>Contact Information:</u> phone: (860) 486 3594	<u>Office Hrs:</u> Mo 2-4 and by appointment
email: mariza@engr.uconn.edu	<u>Location:</u> CAST 314
<u>TA:</u> Nefeli Bompoti	<u>Office Hrs:</u> M 12.30-2.30 W 3-5 and by appointment
email: neveli.bompoti@uconn.edu	<u>Location:</u> CAST 105

TEXTBOOK

Coduto, Yeung and Kitch, Geotechnical Engineering, Principles and Practices, Second Edition, Pearson.

CATALOG DESCRIPTION

Fundamentals of soil behavior and its use as a construction material. Effective stress principle, seepage and flow nets, consolidation, shear strength, limit equilibrium analysis. Written reports.

PREREQUISITES

Prerequisite or co-requisite: CE 3110; enrollment in the School of Engineering.

COURSE OUTCOMES

Upon completing this class the student should be able to:

1. Describe and classify soil types and their properties.
2. Use the appropriate physical quantities and equations to compute relationships of the three subsurface phases (soil, water, air).
3. Perform compaction tests, analyze the results and design soil compaction processes.
4. Perform calculations to describe the movement of water through soil.
5. Calculate internal and external stresses applied to soil.
6. Perform settlement calculations due to consolidation.
7. Interpret the results of strength tests and predict failure conditions in soils.

ABET STUDENT OUTCOMES

Criterion 1.

an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

Students will utilize principles of soil mechanics and mechanics of materials to solve problems related to soil behavior including permeability, compressibility and strength.

Criterion 2.

an ability to apply the engineering design process to produce solutions that meet specified needs with consideration for public health and safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline

The students will design soil compaction processes, meeting technical specification and cost constraints.

COURSE OUTLINE

Week	Date	Day	Material	Chapter	HW*
1	28-Aug	M	Introduction		
		W	Soil composition	4.1-4.3	
		F	Weight-volume relationships	4.3	
2	4-Sep	M	Labor Day		
		W	Problem solving		HW1
		F	Particle size distribution	4.4	
3	11-Sep	M	Problem solving		
		W	Clay soils, Plasticity	4.5-4.6	
		F	Engineering classification of soil (USCS)	5.3	
4	18-Sep	M	Problem solving chapter 5		HW2
		W	Soil compaction	6.1-6.7	
		F	Soil compaction		
5	25-Sep	M	Problem solving chapter 6		HW3
		W	Review session chapters 4-6		
		F	Midterm-I		
6	2-Oct	M	Groundwater and 1-D flow	7.2	
		W	Groundwater and 1-D flow	7.3-7.4	
		F	Problem solving chapter 7		HW4
7	9-Oct	M	Groundwater multidimensional flow – Flow nets	8.1-8.2	
		W	Problem solving chapter 8	8.2	
		F	Stress	9.1-9.2	
8	16-Oct	M	Mohr's circle	9.3	
		W	Problem solving Mohr's circle		HW5
		F	Geostatic and induced stresses	9.4-9.7	
9	24-Oct	M	Problem solving		
		W	Effective stress	9.8-9.9	
		F	Problem solving chapter 9		HW6
10	30-Oct	M	Midterm-II		
		W	Compressibility and settlement	10.1-10.9	
		F	Compressibility and settlement		
11	6-Nov	M	Compressibility and settlement		
		W	Problem solving chapter 10		
		F	Rate of Consolidation	11.1-11.3	
12	13-Nov	M	Problem solving chapter 11		HW7
		W	Soil strength	12.1-12.3	
		F	Mohr-Coulomb failure criterion	12.4	
	20-Nov	MWF	Thanksgiving recess		
13	27-Nov	M	Direct shear test	12.9	

		W	Triaxial compression test	12.9	
		F	Problem solving triaxial test		
14	4-Dec	M	Shear strength of saturated sands and gravels	12.5	HW8
		W	Problem solving chapter 12		
		F	Final review session		

Note: the course outline is approximate and subject to change

* HW assignment dates are approximate. Announcements will be posted on Husky CT and sent through email when HW is posted online.

HOMEWORK

Homework will be assigned for each thematic unit (approximately 8 in total). Homework will be assigned and submitted ELECTRONICALLY through HuskyCT. Make sure to click on “Submit” after you have worked through all the problems.

A one-week period will be granted to submit homework – no exceptions to deadlines are granted without a doctor’s note. Additionally, the TA is not allowed to accept hand-written homework for evaluation; she will only assist with questions prior to the submission deadline. Homework solutions will be provided online after the submission deadline.

GRADES

Midterm I 30%, Midterm II 30%, Homework 10%, Final exam 30%

CLASS POLICY

The lectures in this course build on the previous class’s lecture; regular attendance is strongly recommended to understand the processes taught. The student is responsible for the material taught in a class not attended.

All class presentations are available on HuskyCT. Students are encouraged to bring the slides on their phone, table or computer to follow along with written notes on the board. Slides will be projected on the monitors only during class to allow use of the white board.

No exceptions to deadlines are accepted without proper documentation from a doctor. All exams are open-book. You can bring any material you think is useful.

The TA is NOT responsible for your grades; all complaints should be directed to the instructor.

PLAGIARISM

It is permissible, and encouraged, to work with classmates on problem assignments. As the saying goes, “two heads are better than one”. The purpose of group collaboration is to bring together different viewpoints so a colleague may shed new light on a problem you are grappling with so you can think about it in a different way. You can then apply your altered viewpoint to solve the problem you were concerned with. The purpose of group collaboration is not to collectively put together one solution problem – that provides no benefit for the group

members who must work independently to provide solutions to problems during class examinations. In fact, collective solutions violate the University of Connecticut code on plagiarism and require that actions be taken which may include dismissal from the university. More information about plagiarism can be found at:

http://www.irc.uconn.edu/PlagiarismModule/intro_m.htm

The University of Connecticut policy on Academic Misconduct is contained within the Student Code: http://www.dosa.uconn.edu/student_code.html

Final exam week for Fall 2017 takes place from Monday, December 11, through Saturday, December 16. Students are required to be available for their exam during that time. Students must visit the Dean of Students Office if they cannot make their exam. The DOS will give the student his or her instructions thereafter.

Please note: vacations, previously purchased tickets or reservations, weddings (unless part of the wedding party), and other large or small scale social events, are not viable excuses for missing a final exam. Please contact the Dean of Students office with any questions. Thank you in advance for your cooperation.