

University of Connecticut
CE 4541: Soil Mechanics II
CE5541: Advanced Soil Mechanics

Fall 2017 Course Syllabus

Instructor: Prof. Lanbo Liu **Office:** ABB304 **Tel:** 860-486-1388 **Email:** Lanbo.Liu@UConn.edu

Class times: Mon/Wed/Fri 11:15-12:05 in

Classroom: CAST 201

Office hours: Tuesday and Thursday, 1:30-2:30 PM or by appointment, in ABB304

Texts: we will use the following textbooks as the reference for this course:

- **J. A. Knappett and R. F. Craig, *Craig's soil mechanics*, 8th Edition, Spon Press, 2012.**

Pre-requisites: students should have completed the following courses or an equivalent:

- CE 3510 *Soil Mechanics I* (or equivalent).

Catalog Course Description: Introduction of soil as a multi-phase material; brief overview of origin and mineralogy of soil; stress and strain analysis of soil; soil compression and consolidation; soil shear strength; introduction to critical state soil mechanics.

Course Outcomes: Students completing this course will be able to do the following:

- Understand and explain the attributes and relationships among the fundamental characteristics of soil mechanics rationale.
- Conduct field observations to collect and analyze geotechnical engineering characteristic data and derive relationships among them.
- Apply known relationships among soil characteristics to estimate expected geotechnical conditions.

ABET EAC Student Outcomes:

- (a) **an ability to apply knowledge of mathematics, science, and engineering:** Students will learn mathematical models of soil behaviors that apply principles of single and multivariable calculus and differential equations.
- (b) **an ability to design and conduct experiments, as well as to analyze and interpret data:** Students learn to analyze real data sets and also conduct field experiments to collect soil data for analysis.
- (d) **an ability to function on multi-disciplinary teams:** Students work in teams to collect experimental data for analysis.
- (e) **an ability to identify, formulate, and solve engineering problems:** Students learn to use observations of soil characteristics to analyze and predict conditions under different load scenarios.
- (i) **a recognition of the need for, and an ability to engage in life-long learning:** Students learn that the methods in the published soil test manuals are constantly being updated to improve accuracy and applicability, requiring learning about changes in each update.
- (j) **a knowledge of contemporary issues:** Class discussions about current events relevant to the class are included in the course.
- (k) **an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice:** Students learn to use certain given published test methods (e.g., ASTM) for estimating capacity and level of service.

(Mon) W011: Introduction, Ch. 1, Basic characteristics of soils	
(Wed) W012: Ch. 1, Basic characteristics of soils	
(Fri) W013: Ch. 1, Basic characteristics of soils	HW 1 due
(Mon) W021: Labor Day, no classes	
(Wed) W022: Ch. 2, Seepage flow	
(Fri) W023: Ch. 2, Seepage flow	HW 2 due
(Mon) W031: Ch. 3, Seepage flow	
(Wed) W032: Ch. 3, Finite difference method for seepage	
(Fri) W033: Ch. 3, Seepage through dam	HW 3 due
(Mon) W041: Ch. 4, Effective stress	
(Wed) W042: Ch. 4, Effective stress	
(Fri) W043: Ch. 4, Effective stress, Graduate Term paper topics determined	HW 4 due
(Mon) W051: Ch. 4, Consolidation	
(Wed) W052: Ch. 4, Consolidation	
(Fri, 9/29/17) W053: Mid-term Exam I (HW 1 through 4)	
(Mon) W061: Ch. 5, Soil behavior in shear	
(Wed) W062: Ch. 5, Soil behavior in shear	
(Fri) W063: Ch. 5, Soil behavior in shear	HW 5 due
(Mon) W071: Ch. 6, Ground investigation	
(Wed) W072: Ch. 6, Ground investigation	
(Fri) W073: Ch. 6, Ground investigation	HW 6 due
(Mon) W081: Ch. 7, In-situ testing	
(Wed) W082: Ch. 7, In-situ testing	
(Fri) W083: Ch. 7, In-situ testing	HW 7 due
(Mon) W091: Ch. 8, Shallow foundations	
(Wed) W092: Ch. 8, Shallow foundations	
(Fri) W093: Ch. 8, Shallow foundations	HW 8 due
(Mon) W101: Ch. 9, Deep foundations	
(Wed) W102: Ch. 9, Deep foundations	
(Fri 11/3/17) W103: Mid-term Exam II (HW 5 through 8)	
(Mon) W111: Ch. 10, Advanced foundation topics	
(Wed) W112: Ch. 10, Advanced foundation topics	
(Fri) W113: Ch. 10, Advanced foundation topics	HW 9 due
(Mon) W121: Ch. 11, Retaining structures	
(Wed) W122: Ch. 11, Retaining structures	
(Fri) W123: Ch. 11, Retaining structures	HW 10 due
W13: Thanksgiving Recess – No Class (Nov. 19-24, 2017)	
(Mon) W141: Ch. 12, Stability of self-supporting soil masses	
(Wed) W142: Ch. 12, Stability of self-supporting soil masses	
(Fri) W143: Ch. 12, Stability of self-supporting soil masses	HW 11 due
(Mon) W151: Ch. 13, Illustrative cases	
(Wed) W152: Ch. 13, Illustrative cases	
(Fri) W153: Review for Final Exam	

FINAL EXAM: W16: 10:30-12:30, (Covers entire course, with emphasis after Mid-term II)
Graduate Term Papers Due

Homework: Homework will be assigned in class and electronically on HuskyCT and collected as listed on the schedule above (fundamentally the date of the lecture of a new chapter). Homework problems will be discussed in the class in which they are due, and therefore, late assignments will not be graded. The highest 10 homework scores will count toward the student's grade; therefore, each student may skip only one problem sets without penalty.

Exams: There will be three exams given, a mid-term and a final, on the dates indicated on the above schedule. No makeup will be given for the exams.

Grading: Each portion of the course work will contribute toward the final grade as follows:

CE 4541	HW = 40%	Midterm I = 20%	Midterm II = 20%	Final Exam = 20%
CE 5541	HW = 40%	Term Paper = 20%	Midterm Exams = 20%	Final Exam = 20%

Plagiarism: It is permissible, and encouraged, to work with classmates on problem assignments. 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 11th through Sunday, December 17, 2017. Students are required to be available for their exam during the stated time. If you have a conflict with this time, you must visit the Dean of Students Office to discuss the possibility of rescheduling this exam.

Please note that vacations, previously purchased tickets or reservations, social events, misreading the exam schedule and over-sleeping are not viable excuses for missing a final exam. If you think that your situation warrants permission to reschedule, please contact the Dean of Students Office with any questions. Thank you in advance for your cooperation.