

## CEG 4012 Geotechnical Engineering (3 Credits), Required Course, Spring 2013

**Description:** Subsurface stresses, Settlement Analysis, Site Investigation and InSitu Methods, Shallow and Deep Foundations, Slope Stability, and Lateral Earth Pressures/Retaining Wall Design.

**Prerequisites:** CEG 4011

**Objectives:** Assure students are able to determine the stress increase due to a surface load; to apply stress increase and in situ measurements to analyze foundation settlements; to design shallow foundations (footings) and deep foundations (piles); to analyze the stability of slopes; to determine the stresses against retaining walls; to design retaining walls for various subsurface conditions.

**Lectures:** MWF - 3rd Period – FLG 270

**Instructor:** Dr. Ana Mohseni  
Office: 265F Weil Hall  
Phone: (352) 392-9537 Ext. 1462  
email: [amohseni@ufl.edu](mailto:amohseni@ufl.edu)  
Office Hours: M, W, F- 4<sup>th</sup> and 6<sup>th</sup> periods

**Teaching Assistant:** Karl Kremser  
Office: 268 Weil Hall  
Email: [karlkrem@ufl.edu](mailto:karlkrem@ufl.edu)  
Office Hours: TBD

**Grader:** Paola Vargas  
Office: 170 Weil Hall  
Email: [paola.vargas005@ufl.edu](mailto:paola.vargas005@ufl.edu)  
Office Hours: under appointment only

**Text and Notes:** Notes for each lecture will be provided in PDF format and posted on Sakai. The notes are partially blank and can be completed by following the lecture. At the completion of the course, the notes will serve as a good reference, so make sure to attend lectures and bring the notes.

Additional reading: *Principles of Geotechnical Engineering*, Braja M. Das, Seventh Edition

**Grading:** Exams – 4 = 70%  
In-Class Exercises – 2 = 10%  
Homework – 9 = 20%

Final letter grades will be assigned based on the following scale:

A	94
A-	90
B+	87
B	83
B-	80
C+	77
C	73
C-	70
D+	67
D	63
D-	60
E	0

A C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

**Assignments:** Homework will be assigned approximately weekly and it is due at the start of the class period on the day specified; no later than 9:45 AM. Late homework can be turned in by 5 PM on the due date in the TAs office for a 10% penalty. **DO NOT SLIP HOMEWORKS UNDER THE DOOR!** Any homework turned in after 5 PM will receive zero. These rules apply unless advance written notice has been submitted to the instructor for valid excuses.

In-Class exercises will consist of small groups of students applying the concepts from lectures to practical problems. Each problem will be provided by the instructor in a clearly defined problem statement, will require your knowledge of geotechnical engineering and will cover, at least, one class period. Only student attending class on the day of the in-class exercise will get grade for it. Grading will be based on the completeness of the solution, i.e., show your work. Engineering judgment is required so include statements explaining the group decisions. Each student in the group will receive the same grade, but it is expected that each contributes!

#### Homework, In-class exercises and Exam Submission Instructions

1. Submit your HW and In-class exercises with all sheets stapled. Your name, class course and homework number should be on the first sheet – clearly written.
2. Be clean with your work. Give enough space between the answers to the problems. Clearly mark (**box or highlight**) your answers.
3. Late homework should be submitted in the TAs office, it should be given to him in person. If you cannot make in time for the TA's or instructor's office, scan your homework and send the file to the TA before by 5 PM on the due date.

Exams will be given in-class on a one hour period. Each exam will concentrate on the material most recently covered. No open notes during exam. You are allowed to bring a cheat-sheet (front and back) with formulas and notes. No solved exercises are allowed on the cheat-sheet. The cheat-sheet must be turned with your name on it when you turn the exam. Do not miss an exam unless you have a valid excuse. Make-up exams will only be rescheduled if prior approval is granted and the student must make a reasonable attempt to take the exam prior to the scheduled exam date.

The instructor and assistants will discuss any exam, homework within 1 week (excluding holidays) after return. After this time discussion is **closed**.

**Honesty Policy:** All students admitted to the University of Florida have signed a statement of academic honesty, committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and others. This will be strictly enforced.

**Accommodations for Students with Disabilities:** Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the instructor when requesting accommodation.

### Tentative Course Outline

Week day	Month	Day	Lecture #	Description	HW
M	Jan	7	1	Introduction, Review of Geostatic Stresses	
W	Jan	9	2	Stresses due to Surface Loads - Pyramid approximation, Circular load	
F	Jan	11	3	Stresses due to Surface Loads - Strip, Square, Rectangular footings and embankments	HW-1
M	Jan	14	4	Settlements in Clay - Elastic Settlements	
W	Jan	16	5	Consolidation Settlement - NC Clay	
F	Jan	18	6	Overconsolidated Clays, Secondary Compression	HW-1 due date, HW-2
M	Jan	21	-	---Holiday - No class---	
W	Jan	23	7	Time rate consolidation	
F	Jan	25	8	Settlement of Footings on Sands	HW-2 due date, HW-3
M	Jan	28	8	Settlements of Footings on Sands cont.	HW-3
W	Jan	30	9	Allowable Foundation Settlements	
F	Feb	1	10	Site Investigation	
M	Feb	4	-	Review #1	HW-3 due date
W	Feb	6	-	<b>Test 1 - Stresses / Settlement</b>	
F	Feb	8	11	Bearing Capacity - Terzaghi	
M	Feb	11	12	Bearing Capacity - Meyerhof	
W	Feb	13	13	Bearing Capacity - Eccentric Loaded Footings	HW-4
F	Feb	15	14	Deep Foundations - Piles	
M	Feb	18	15	Deep Foundations - Piles Exercises	
W	Feb	20	16	Drilled shafts	HW-4 due date, HW 5
F	Feb	22	17	Pile Group	

M	Feb	25	17	Pile Group cont.	
W	Feb	27	-	Review #2	HW-5 due date
F	Mar	1	-	<b>Test 2 - Site Investigation/ Bearing Capacity / Deep Foundations</b>	
M	Mar	4	-	-- Spring Break -- No class	
W	Mar	6	-	-- Spring Break -- No class	
F	Mar	8	-	-- Spring Break -- No class	
M	Mar	11	18	FB Deep	
W	Mar	13	-	<b>In-class exercise 1: FB Deep</b>	
F	Mar	15	19	Stability of earth embankments / Infinite Slopes	In-Class 1 due date, HW-6
M	Mar	18	20	Finite Slopes	
W	Mar	20	21	Taylor Charts	
F	Mar	22	22	Rapid Drawdown / Summary	HW-6 due date, HW-7
M	Mar	25	23	Method of slices	
W	Mar	27	-	Review #3	HW-7 due date
F	Mar	29	-	<b>Test 3 - Slope Stability</b>	
M	Apr	1	-	Slope/W	
W	Apr	3	-	Slope/W cont.	
F	Apr	5	-	<b>In-class exercise 2: Slope/W</b>	
M	Apr	8	24	Earth Pressures - Rankine /Sand/Clay	In-class 2 due date
W	Apr	10	25	Earth Pressures - Coulomb	HW-8
F	Apr	12	26	Earth Pressures - Surcharge	
M	Apr	15	27	Retaining Wall Modes of Stability	HW-9
W	Apr	17	28	Retaining Wall Modes of Stability	HW-8 due date
F	Apr	19	-	Review #4	HW-9 due date
M	Apr	22	-	<b>Test 4 – Retaining Wall</b>	
W	Apr	24	-	No class	