

**CEG 4012 Geotechnical Engineering (3 Credits), Required Course, Fall 2012**

**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; to apply Allowable Stress Design (ASD) and Load and Resistance Factor Design (LRFD) methods.

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

**Instructor:** Ana Mohseni

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email: [amohseni@ce.ufl.edu](mailto:amohseni@ce.ufl.edu) **Office Hours:** M, W, F- 4<sup>th</sup> and 6<sup>th</sup> periods

**Teaching Assistant:** Karl Kremser

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**Office Hours:** : T,R- 3<sup>rd</sup> and 4<sup>th</sup> periods

**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 – 10 = 20%

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

A	94
A-	90
B+	87.5
B	85
B-	82.5
C+	80
C	77.5
C-	75
D+	72.5
D	70
D-	67.5
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 will be due at the beginning of the lecture of the due date. Homework is due at the start of the class period on the day specified; no later than 2 PM. Late homework can be turned in by 5 PM on the due date in the soils lab for a 10% penalty. 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 soil mechanics 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!

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 or lab grade 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
W	Aug	22	1	Introduction, Review of Geostatic Stresses	
F	Aug	24	2	Stresses due to Surface Loads - Pyramid approximation, Circular load	
M	Aug	27	3	Stresses due to Surface Loads - Strip, Square, Rectangular footings and embankments	HW-1
W	Aug	29	4	Settlements in Clay - Elastic Settlements	
F	Aug	31	5	Consolidation Test, Consolidation Settlement	HW-1 due date
M	Sept	3	–	---Labor day – No class---	
W	Sept	5	6	Normally Consolidated Clays	
F	Sept.	7	7	Overconsolidated Consolidated Clays, Secondary Compression	HW-2
M	Sept.	10	8	Time rate consolidation, Settlement of Sands	
W	Sept.	12	9	Settlements of Footings on Sands	HW-3
F	Sept.	14	10	Allowable Foundation Settlements	HW-2 due date
M	Sept.	17	11	Site Investigation	
W	Sept.	19	12	Bearing Capacity – Terzaghi	HW-3 due date
F	Sept.	21	–	Review #1	
M	Sept.	24	–	<b>Test 1 - Stresses / Settlement</b>	
W	Sept.	26	13	Bearing Capacity - Meyerhof	
F	Sept.	28	14	Bearing Capacity - Eccentric Loaded Footings / In-situ tests	HW-4
M	Oct.	1	15	Deep Foundations - Piles	
W	Oct.	3	16	Deep Foundations - Piles Exercises / Layered Soils	
F	Oct.	5	17	FB Deep	HW-4 due date
M	Oct.	8	–	<b>In-class exercise 1: FB Deep</b>	
W	Oct.	10	18	Pile driving / capacity tests (in-class exercise 1 due date)	
F	Oct.	12	19	Drilled shafts	
M	Oct.	15	20	Pile Group	HW-5
W	Oct.	17	21	Stability of earth embankments / Infinite Slopes	HW-5 due date
F	Oct.	19	22	Finite slopes / Taylor's charts	HW-6

M	Oct.	22	23	Method of slices	
W	Oct.	24	24	Rapid Drawdown / Summary	HW-6 due date, HW-7
F	Oct.	26	–	Review #2	
M	Oct.	29	–	<b>Test 2 - Site Investigation / Bearing Capacity / Deep Foundation</b>	
W	Oct.	31	–	Slope/W software	
F	Nov.	2	–	Slope/W software	
M	Nov.	5	–	<b>In-class exercise 2: Slope/W</b>	HW-7 due date
W	Nov.	7	25	Earth Pressures - Rankine / Sand / Clay (in-class exercise 2 due date)	HW-8
F	Nov.	9	–	Homecoming – No class	
M	Nov.	12	–	---Veteran's day - No class---	
W	Nov.	14	26	Earth Pressures - Surcharge	HW-8 due date
F	Nov.	16	–	Review #3	
M	Nov.	19	–	<b>Test 3 - Slope Stability</b>	
W	Nov.	21	–	--- No class ---	
F	Nov.	23	27	Earth Pressures - Coulomb	HW-9
M	Nov.	26	28	Retaining Wall Modes of Stability	HW-9 due date, HW-10
W	Nov.	28	–	Review #4	
F	Nov.	30	–	Review #4	HW-10 due date
M	Dec.	3	–	<b>Test 4 – Retaining Wall</b>	
W	Dec.	5	–	No class	