

CEG 4011

SOIL MECHANICS

Physical properties of soils, compaction, flow of water through soil, distribution of stress within soil and consolidation. Laboratory. (Credits: 4 hrs.)

Prereq: EGM 3520

Goals: This course, the first of two required courses in the area, introduces the civil engineering student to the fundamentals of *Soil Mechanics* – essentially, what soil is, its origin and how it behaves under various conditions (i.e., water, load, etc.).

Outcomes: This course requires the student to apply basic math, science and engineering principles to solve engineering problems. The weekly laboratory sections require the ability to conduct experiments and analyze and interpret data. Working in groups fosters the ability to function efficiently as a team. The written laboratory reports represent forms of technical communication. Homework and the four exams require the ability to identify, formulate and solve engineering problems.

Objectives: The student is expected to learn:

- the basics of physical geology – the rock cycle, plate tectonics, origin, transportation and deposition of soils, etc.
- the definitions of Soil Mechanics and the use of Phase diagrams
- to calculate geostatic stresses
- to classify soils by the USCS and AASHTO systems
- to make calculations on the 1- and 2-D flow of water through soils
- to calculate the settlement of structures on clay and sand
- the fundamentals of soil shear strength
- the procedures for performing standard soil laboratory tests.

INSTRUCTOR: Ana Mohseni, PhD
265F Weil Hall
(amohseni@ufl.edu)
392-9537 × 1462
Office Hours – M, W, F – 4th and 6th periods

GRAD/UNDERGRAD TEACHING ASSISTANTS:
Many T.A.s
Weil 170 – Soils Lab
Office hours will be posted on Sakai.

MEETING TIMES: 7th Period, M, W, F – FLG 280
Labs 8th – 10th periods (MTWThF– day depends on your section)
Room 170 Weil Hall

TEXT: None Required.

DATE			TOPIC
W	AUG	22	INTRODUCTION, OVERVIEW OF COURSE, DEFINITIONS
F		24	GRAIN SIZE, SHAPE, ANGULARITY
M		27	PHASE DIAGRAMS
W		29	**PHASE DIAGRAMS (HW 1 ASSIGNED)
F		31	ATTERBERG LIMITS, SOIL STRUCTURE
M	SEPT	3	NO CLASS (LABOR DAY)
W		5	**SOIL CLASSIFICATION (HW 1 DUE, HW 2 ASSIGNED)
F		7	SOIL CLASSIFICATION CONT.
M		10	**GEOLOGY OF SOILS (HW 2 DUE)
W		12	REVIEW FOR TEST NO. 1
F		14	TEST NO. 1
M		17	GEOSTATIC STRESSES
W		19	**GEOSTATIC STRESSES CONT. (HW 3 ASSIGNED)
F		21	GEOSTATIC STRESSES CONT.
M		24	PERMEABILITY
W		26	**1-D FLOW (HW 3 DUE, HW 4 ASSIGNED)
F		28	1-D FLOW
M	OCT	1	1-D FLOW CONT.
W		3	**2-D FLOW (HW 4 DUE, HW 5 ASSIGNED)
F		5	2-D FLOW
M		8	**REVIEW OF GEOSTATIC STRESS (HW 5 DUE)
W		10	REVIEW OF 1 & 2-D FLOW
F		12	TEST NO. 2
M		15	**STRESSES DUE TO SURFACE LOADS (HW 6 ASSIGNED)
W		17	SETTLEMENT OF CLAY/CONSOLIDATION TEST
F		19	**CONSOLIDATION SETTLEMENT-NORMALLY CONSOLIDATED (HW 6 DUE)
M		22	**CONSOLIDATION SETTLEMENT-OVERCONSOLIDATED (HW 7 ASSIGNED)
W		24	TIME RATE OF CONSOLIDATION/SETTLEMENT OF SAND
F		26	**CASE STUDIES OF SETTLEMENT (HW 7 DUE)
M		29	COMPACTION
W		31	REVIEW FOR TEST NO. 3
F	NOV	2	TEST NO. 3
M		5	**MOHR CIRCLE (HW 8 ASSIGNED)
W		7	MOHR CIRCLE CONT.
F		9	NO CLASS (HOMECOMING)
M		12	NO CLASS (VETERANS DAY)
W		14	**MOHR CIRCLE CONT. (HW 8 DUE)
F		16	SHEAR STRENGTH
M		19	**SHEAR STRENGTH CONT. (HW 9 ASSIGNED)
W		21	NO CLASS
F		23	NO CLASS (THANKSGIVING)
M		26	MOHR CIRCLE AND SHEAR STRENGTH REVIEW
W		28	**LAB PRACTICAL / LAB REVIEW (HW 9 DUE)
F		30	REVIEW FOR TEST NO. 4
M	DEC	3	TEST NO. 4
W		5	NO CLASS

Each student must attend lab. Failure will result in a 2% course grade reduction. Lab reports are due at the beginning of the next lab meeting, unless otherwise instructed. -10% per day late. No credit will be given after one week, **however you are still responsible for completing the lab report to pass the class.**

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.

GRADING: Final letter grades will be determined from the following scale:

Points			
Test #1	18	A	94
Test #2	18	A-	90
Test #3	18	B+	87.5
Test #4	18	B	85
Lab Reports	18	B-	82.5
Homework	<u>10</u>	C+	80
TOTAL	100	C	77.5
		C-	75
		D+	72.5
		D	70
		D-	67.5

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**.

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>

Prior consent of the instructor or a doctor's certificate of illness is the only satisfactory excuses for missed classes, labs or tests.

All students admitted to the University of Florida have signed a statement of academic honesty committing them 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 student at the University of Florida and to be honest in all work submitted and exams taken in this class and all others.

Accommodation 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 course instructor when requesting accommodation.

UF Counseling Services –Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.*
- Career Resource Center, Reitz Union, 392-1601, career and job search services.*

Software Use – All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.