

2010



Civil and Construction Engineering

CCE 3360 – Soil Mechanics

COURSE DESCRIPTION

The course focuses on the study of the physical properties of soil and the behavior of soil masses subjected to various types of forces. Further, this course will focus on origin of soil and its grain size distribution, ability to drain water, compressibility, shear strength, and load-bearing capacity. During this course, students will learn application of laws of mechanics and hydraulics to engineering problems dealing with different soil types.

COURSE OBJECTIVES

Students know how to

1. use weight-volume relations in borrow pit and excavation/embankment problems,
2. perform soil classification using AASHTO and Unified Soil Classifications Systems,
3. calculate optimum moisture content from Proctor compaction test results,
4. calculate equivalent hydraulic conductivity of stratified soil,
5. use flow nets in seepage problems,
6. calculate total and effective stresses in a soil mass,
7. calculate stresses developed in a soil mass under various load configurations,
8. calculate elastic, and primary and secondary consolidation settlements, and
9. apply Mohr-Coulomb failure criterion to calculate shear strength parameters.

PREREQUISITE

ME 2570: Mechanics of Materials

INSTRUCTOR

Dr. Upul Attanayake, P.E.

G242 – Parkview Campus

Office Hours: Monday and Wednesday from 11 a.m. to 1 p.m.

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E-mail: upul.attanayake@wmich.edu

Note: I am committed to reply your e-mails within 24 hours and expect the same from you!

All the communications are through WebCT

TEXT BOOK

Principles of Geotechnical Engineering, by Braja M. Das, 7th Edition, 2006

ISBN-13:978-0-495-41130-7

TENTATIVE COURSE OUTLINE

1. Introduction
2. Origin of Soil and Grain Size (Ch 2)
3. Weight-Volume Relationships (Ch 3)
4. Plasticity, and Structure of Soil (Ch 4)
5. Engineering Classification of Soil (Ch 5)
6. Soil Compaction (Ch 6)
7. Permeability (Ch 7)
8. Seepage (Ch 8)
9. In Situ Stresses (Ch 9)
10. Stresses in a Soil Mass (Ch 10)
11. Compressibility of Soil (Ch 11)
12. Shear Strength of Soil (Ch 12)

CLASS TIME AND LOCATION:

Monday and Wednesday: 9:30 a.m. - 10:20 a.m. Location: Room D115.

GRADING SCHEME

FINAL GRADE

		GRADE	PERCENT
Quizzes and in-class assignments	5%		
Homework*	10 %	A	90 - 100
Labs	30 %	BA	85 - 89
Test I (Ch 2 – Ch5) ⁺	15 %	B	80 - 84
Test II (Ch 6 – Ch 9) ⁺	15 %	CB	75 - 79
Final Exam ⁺	25 %	C	70 - 74
(25% Ch 2 – Ch 9 + 75% Ch 10 onwards)		DC	65 - 69
		D	60 - 64
Total	100 %	F	< 60

Exams: TBA

* **Note:** Each homework question may not be equally weighted. It is student's responsibility to answer all the questions unless instructed to do otherwise.

+ **Note:** Exams/tests/quizzes may contain questions to evaluate student understanding of basic concepts rather than mechanistic use of equations. In that case, evaluation will be conducted in closed book format and use of calculators will NOT be permitted.

NOTES

1. **Attendance:** Attendance in lectures and laboratories is *mandatory*.
2. **Homework:** All homework and laboratory reports should be compiled in an organized and neat manner. Start each new problem on a new page. Provide a cover sheet with your name, homework number, and date of submission clearly indicated. **Staple** all sheets.

Homework is due at the *beginning of class on the dates specified*. Absolutely no late homework. Use of available tools (e.g., MS-office software module) for producing reports, graphs, charts, tables, etc., are encouraged. Make sure to state appropriate units in calculations.

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3. **Exams:** Absolutely no Makeup Exam except for medical reasons verified by WMU Health Center Physicians.
4. **No laptops** are allowed during regular class period.
5. **No electronic devices (except calculators)** are allowed during regular class period.

STUDENT CONDUCT:

You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate and Graduate Catalogs that pertain to Academic Honesty. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. [The policies can be found at <http://catalog.wmich.edu> under Academic Policies, Student Rights and Responsibilities.] If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Conduct. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.