

CEE 761 Soil Mechanics I Consolidation and Settlement

Professor: Mark T. Bowers, PhD, PE

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Office Hours: Please call my secretary at 556-5427 for an appointment

Text: Advanced Soil Mechanics, B.M. Das, 2nd edition, 1997, Taylor & Francis.

Course Objective: To advance the students' knowledge and experience concerning stresses in a soil mass, consolidation and the evaluation of soil settlement. Various methods will be used to meet these objectives including classroom lectures, homework including hand and computer solutions, laboratory experiments, and the preparation of a graduate quality research paper or project report.

Grading: The grading for the course will be based on the following distribution:

Homework.....	40%
Midterm Exam.....	20% (Thursday, Oct. 26)
Research Paper.....	20%
Final Exam.....	20% (Tuesday, Dec. 5, 4-6 pm)

All the work must be satisfactorily completed in order to pass the course.

Research Paper: I expect this paper to be a reflection of your status as a graduate student and your desire to learn more about geotechnical engineering. This paper could form the literature review for your thesis, project, or dissertation. Plan on a minimum 20 page (double spaced) body of the report. The topic chosen must have my approval and must be in the subject area of consolidation and settlement. See attached grading criteria.

Some possible research topics include:

- Consolidation of very soft soils
- Expansive soils
- Settlement of earthfill/rockfill embankments
- Case histories of monitored settlement (other than embankments)
- Subsidence due to fluid withdrawal from the earth
- Subsidence due to underground excavation, mine collapse, etc.
- Precompression for the support of shallow foundations
- Tolerance of structures to settlement
- Settlement associated with deep fills
- Settlement of peats and organic soils
- Settlement induced by evapotranspiration/tree roots, etc.
- Soil improvement techniques to reduce settlement (other than precompression)

Schedule for Autumn Quarter 2006:

<u>Class:</u>	<u>Reading:</u>	<u>Topic:</u>
9/21	3.1-3.7	Introduction to Consolidation & Settlement; Stresses in a Soil Mass; Two-Dimensional Problems
9/26, 28	3.1-3.7 3.8-3.15	Stresses in a Soil Mass; Two-Dimensional Problems (cont'd); Three-Dimensional Problems
10/3,5	3.8-3.15 6.1-6.7	Stresses in a Soil Mass; Three-Dimensional Problems (cont'd); Fundamentals of Consolidation
10/10,13	6.1-6.7	Fundamentals of Consolidation (continued)
10/17,19	-----	Laboratory Determination of Consolidation Parameters
10/24,26	6.8-6.11	Fundamentals of Consolidation (continued); MIDTERM EXAM (Wed., Oct. 26)
10/31, 11/2	6.12-6.15	Consolidation via Sand Drains & Wicks
11/7,9	8.1-8.9	Evaluation of Soil Settlement; Immediate Settlement
11/14,17	8.10-8.15	Settlement Analysis
11/21	8.16	Precompression to Improve Foundation Soils
11/28,30	-----	Special Topics in Consolidation & Settlement
12/5	-----	Final Exam

Draft of June 6, 2006 (MTB)