

Faculty Course Assessment Report
North Dakota State University
Department of Construction Management and Engineering
 CM&E 320, Soils and Foundations, 4 credits
 Fall 2010 – Jongchul Song

Catalog Description:

This course provides a discussion of the aspects of engineering and physical properties of soils; stress; settlement; consolidation; slope stability; earth pressure; bearing capacity; drainage; pore pressure; and foundations. 3 lectures, 1 three-hour laboratory. Prereq: CM&E 250.

Grade Distribution:

A	B	C	D	F	W	Total
30	26	7	0	0	1	64

Modifications Made to Course:

The following changes have been made from the previous offering by another instructor:

- Developed new lecture materials that used physical rather than mathematical arguments in presenting basic topics of soil mechanics and geotechnical engineering, and emphasized how they are applied in practical situations
- Lab sessions alternated material testing, and problem solving that required applications of soil mechanics concepts; instructor himself ran a quarter of material testing lab sessions, all the problem solving sessions.
- Effectiveness seems limited as reflected in the SROI comment “the class seems to be more structured towards engineering than management.”

Course Outcomes Assessment ACCE: (matrix content)

This course covered the following ACCE matrix contents:

1	General Education	
1.1	Communication [Oral and Written]	6
1.2	Ethics	1
4	Construction Science	
4.1	Design Theory	
4.11	Structural Mechanics; Electricity; Thermodynamics; Soil Mechanics	16
4.2	Analysis and Design of Construction Systems	
4.21	Civil	21
4.3	Construction Methods and Materials [including: concrete, steel, wood, and soils]	
4.31	Composition and Properties	1
4.33	Standard designations, sizes, and graduations	1
4.34	Conformance references and testing techniques	10
5	Construction	
5.2	Planning and Scheduling	
5.21	Parameters affecting project planning	4
	Instructional Hours (Indicated on matrix)	60

Course Outcomes Assessment (ABET):

Not applicable.

Communications Component:

The following assignments included written communications as one of the evaluation criteria. They were evaluated for clarity and completeness:

- Problem#2 Interpreting soil reports
- Problem#6 Evaluating need for excavation support

The following included oral and written communications component. The basis for assessing writing was similar to the above, and oral presentation was evaluated primarily based on the student's ability to answer questions of the instructor:

- Problem#3 Analysis of field compaction quality and subsequent changes to field operations
- Problem#5 Selection of construction dewatering methods

Although there were some quiz and exam questions that involved a short essay of explanation or justification, they were not graded as communications component.

Ethics Component:

- Bid unbalancing: class#2 slide, Quiz 1 question 3, Exam 1 question 1
- Withholding of relevant subsurface information: class#21 slides

Contemporary Issues Component:

There were no contemporary issues addressed in the course.

Student Feedback:

SROI course rating 3.258, instructor rating 3.742. Student written comments include:

- "The amount of information given seemed like more than was possible to absorb in the amount of time we had. I think if the course were to continue as it is, it should be in a larger time slot or split into a 2 part class."
- "The course material and relating it to applied construction was not done very well."

Reflection:

It was a very challenging course to teach as the instructor had no background in soil mechanics. The same textbook as in the last offering was required for the course, but the instructor finds it inadequate in that it does not provide explanations that are necessary for the students to develop understanding of soil mechanics concepts and applications. The majority of the class did not see how the contents of this course could assist them in more rapidly gaining the experience and knowledge necessary to manage geotechnical construction. It was frustrating that they seemed to consider this course to be only for construction engineering students.

Proposed Actions for Course Improvement:

The instructor would propose the following for course improvement, which is to be re-considered when the summative student feedback becomes available:

- Use a different textbook , such as *Soil Mechanics Concepts & Applications* by Powrie, W., or *Craig's Soil Mechanics* by R.F. Craig, or *The Mechanics of Soils and Foundations* by John Atkinson.
- Combine lecture with lab/problem solving session
- Introduce concepts of soil mechanics AFTER giving the students some exposure to their applications in construction
- Use a few real-world projects for case studies in which students can put theories and practices into a wider context.