Pennsylvania State University  
CE 335 (I) Engineering Mechanics of Soils; Fall 2010  
T R 9:45 - 11:00 AM, 258 WILLARD

This course explores the engineering properties of soils, fundamental soil mechanics, and their applications in Geotechnical Engineering. Specific topics covered in this course include soil compositions, soil classification, ground water flow and seepage analysis, stress analysis, compaction, consolidation, strength behavior, bearing capacity, lateral earth pressure, slope stability analysis, and subsurface exploration.

Prerequisites: E MCH 213; GEOSC 001 or AE 221

Instructor:  Dr. Prasenjit Basu  
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Office Hours:  T 4:00-5:30 PM, W 4:00-5:30 PM, and/or through prior appointments


Course Objectives: The overall objective of this course is to make you acquainted with basic mechanical behavior of soil and introduce you to the field of Geotechnical Engineering. At the end of the semester you should be able to

- classify soil based on its grain characteristics and index properties
- analyze steady-state seepage through soil medium
- calculate geostatic and induced (by external loading) stresses at any point within a soil mass
- calculate immediate (elastic) and consolidation settlements
- calculate shear strength of fine-grained (‘cohesive’) and coarse-grained (‘cohesionless’) soils
- calculate lateral earth pressures under *in situ*, active and passive conditions
- apply your acquired knowledge of soil mechanics in analyzing basic problems related to
  - the stability of ground slopes
  - the bearing capacity of shallow foundations
Course Website: Course related materials (as required during the semester) will be posted on ANGEL (https://cms.psu.edu). Please check it regularly.

If you are using the Communicate tab in ANGEL for course related e-mails, please check "Send a copy to each recipient's Internet e-mail" under 'Message Options'.

Exams: Midterm 1: September 30, 2010; during regular class hours
Midterm 2: November 4, 2010; during regular class hours
Final: Week of December 13 (Please refer to your e-lion account)

**NO makeup exam** will be arranged other than special circumstances. In case of any emergency, please inform me through e-mail. If no notification is made before the starting of the exam, there would NOT be any opportunity for makeup exam.

Homework: All homework will be due in the beginning of the class on the date mentioned in those. Please neatly organize your homework solutions on engineering papers with each problem starting on a new page. Use front side of the page only.

For late submissions (no later than one week after the assigned due date), 10% will be deducted from the total points earned on that particular homework.

Quizzes: In-class quizzes will be given at the beginning or end of a class. Best \((n-1)\) out of \(n\) quiz grades will be considered for calculating the final grade. Quiz dates will be announced in advance.

Reading Assignments: Reading assignments (selected textbook sections) will be given that are directly related to the material covered in class. You are expected to read these sections before coming to the next class.

Attendance: Attending **all the classes** is important and it is strongly recommended. Although no separate grade is allotted, attendance records may be used to improve your final grade in case of a border-line scenario. However, to have this privilege you should attend at least 90% of classes.

Grades: **Best midterm** – 25%
**Other midterm** – 20%
**Final** – 25%
**Homework** – 20%
**Quiz** – 10%
Course Outline

The content of the course, as outlined below, may undergo minor changes during the semester. In addition to the following topics, if time permits, some other related materials may also be presented in the class.

- Introduction to soil mechanics and geotechnical engineering
- Origin and different soil deposits
- Soil as a three-phase system
- Index properties of soils
- Grain characteristics: particle size and shape
- Mechanical analysis of soils
- Consistency limits
- AASHTO and USCS classification
- Soil permeability
- Flow through soil: Seepage analysis
- Effective stress principle
- Geostatic and load-induced stresses
- Soil compaction
- Soil compressibility: 1D consolidation theory
- Shear strength of soils
- Lateral earth pressure: in situ, active and passive conditions
- Introduction to bearing capacity theory
- Introduction to slope stability analysis
- Subsurface exploration
Academic Integrity

This course will follow the University Faculty Senate Policy 49-20 on academic integrity. Below are excerpts from the same policy (http://www.psu.edu/ufs/policies).

Definition and expectations: Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University’s Code of Conduct states that all students should act with personal integrity, respect other students’ dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts.

Academic integrity includes a commitment by all members of the University community not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.

To protect the rights and maintain the trust of honest students and support appropriate behavior, faculty and administrators should regularly communicate high standards of integrity and reinforce them by taking reasonable steps to anticipate and deter acts of dishonesty in all assignments (Senate Policy 44-40: Proctoring of Examinations). At the beginning of each course, it is the responsibility of the instructor to provide students with a statement clarifying the application of University and College academic integrity policies to that course.

For more information, please go to http://www.psu.edu/ufs/policies