

ABET course syllabus (Foundation Engineering)

1. *Course number and name*
0901331: Foundation Engineering
2. *Credits and contact hours*
3 Credit Hours
3. *Instructor's or course coordinator's name*
Instructor: Wassel AL Bodour, Assistant Professor of Civil Engineering
Course Coordinator: Wassel AL Bodour, Assistant Professor of Civil Engineering
4. *Text book, title, author, and year*
 - “Principles of Foundation Engineering”, Braja M. Das, 7th Edition, SI Edition, , 2011, Cengage Learning ,Stamford, CT 06902, USA
 - “ Foundation Analysis and Design”, Joseph E. Bowles, , 5th Edition, 2001, McGraw Hill
 - a. *other supplemental materials*
 - “ Soil Mechanics Principles and Parctice”, Graham E. Barnes, 3rd Edition, 2010, Palgrave Macmillan
5. Specific course information
 - a. *brief description of the content of the course (catalog description)*
Subsurface exploration. Bearing capacity of soil and rock. Stresses due foundation loads. Shallow foundation settlement. Factors considered for shallow foundation design. Deep foundations: capacity and settlement. Lateral earth pressure and retaining walls. Foundations on expansive soils. Slope stability
 - b. *prerequisites or co-requisites*
Prerequisite: Geotechnical Engineering (0901232)
 - c. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*
Required for Civil Engineering
6. Specific goals for the course
 - a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*
 - The student will be able to describe the process of subsurface exploration.
 - Student will be able to analyze shallow foundations on clay or sand that satisfy the allowable bearing capacity and settlement requirements based on soil properties
 - Student will be able to analyze single piles and pile groups that satisfy the bearing capacity and settlement requirements;

- Student will be able to analyze lateral earth pressure
- Student will be able to design foundations on expansive soils
- Student will be able to evaluate stability of slopes

b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

Course addresses ABET Student Outcome(s): a, c, and e

7. *Brief list of topics to be covered*

- Introduction
 - Soil mechanics review
 - Subsurface exploration
- Bearing capacity of Shallow foundations on soils
 - Spread footing
 - Continuous wall footing
 - Strip footing
 - Mat foundation
 - Strap footing
 - Odd-shape footing
- Bearing capacity of Foundation on rock
- Settlement of shallow foundations
 - Theory of Elasticity/settlement
 - Schmertmann method
 - Consolidation
 - Rock settlement
- Deep foundations
 - Geotechnical capacity of driven piles
 - Settlement of driven piles
 - Geotechnical design of driven piles
- Lateral earth pressure
 - Geostatic earth pressure
 - Active earth pressure
 - Passive earth pressure
 - Rankine's theory
 - Coulomb' method
 - Retaining walls
 - Sizing earth retaining walls
- Foundation on expansive soils
 - Expansive soils definitions and identification
 - Shallow foundations for expansive soils
 - Deep foundations for expansive soils
 - Negative skin friction
- Slope stability analysis
 - Limit equilibrium concept
 - Moment method
 - Method of slices

- Fellenius method
- Ordinary method
- Bishop method
- Rotational and translational failure

Exams:

Grading: The grade for the class will be as follows

Points (100% total):

Midterm Exam: 30% **Sunday, March 23th, 2015**

Design Project: 20% **Monday, April 27th, 2015**

Final Exam 50%

Exams: Every student must do their work individually. Cheating will result in an F grade.

Attendance: Students are expected to attend **EVERY CLASS SESSION** and they are responsible for all material, announcements, schedule changes, etc., discussed in class. The university policy regarding the attendance will be strictly adhered to.

Make up/Medical Excuses: Medical or any other excuses are not accepted and whoever misses one or more exams will not be given the opportunity to makeup

Instructor Information

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Extension: 22746

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Office Hours: Sun Tues Thurs [Noon to 2:00 pm]

Mon Wed [9:30 am to 11:00 am]