

1. *Course number and name*
ENGR 430 Soil Mechanics

2. *Credits and contact hours*
3 Credit Hours

3. *Instructor's or course coordinator's name*
Instructor: T.B. D'Orazio, Professor of Civil Engineering
Course coordinator: T.B. D'Orazio, Professor of Civil Engineering

4. *Text book, title, author, and year*
Coduto, E., Introduction to Geotechnical Engineering, 2nd edition, Prentice-Hall, 2011
Lab Manual: Das, V., Laboratory Testing in Soil Mechanics, Wiley, 2012.

a. other supplemental materials
None.

5. *Specific course information*

a. brief description of the content of the course (catalog description)
Soil as an engineering material with emphasis on identification, physical and mechanical properties. Evaluation of water flow through soil, settlement, soil strength, earth pressures, pile pullout capacity, and basic slope stability. Laboratory based term project.

b. prerequisites or co-requisites
ENGR. 309

c. indicate whether a required, elective, or selected elective course in the program
Required for Civil Engineering.

6. *Specific goals for the course. Specific outcomes of instruction.*

- The student will demonstrate an ability to visually identify and classify soils.
- The student will demonstrate an ability to classify soils based on the results of laboratory tests.
- The student will demonstrate an ability to perform fundamental soil laboratory tests.
- The student will demonstrate an ability to evaluate and present the results of fundamental soil laboratory tests.
- The student will demonstrate an ability to describe basic soil compaction specifications in terms of maximum dry density and optimum water content based on the results of laboratory compaction tests.
 - The student will demonstrate an ability to recognize and describe potential problems at a particular site given a soil profile and other environmental type information.
- The student will demonstrate an ability to propose and develop solutions to geotechnical problems and understand their impact on the surroundings.
- The student will demonstrate an ability to calculate in situ total and effective stress from standard soil profile information.
- The student will demonstrate an ability to evaluate consolidation properties from the results of consolidation tests.
- The student will demonstrate an ability to evaluate settlement given load and soil property information.

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, b, c, e, f, g, h, k.

7. *Brief list of topics to be covered*

- Clay mineralogy
- Clay structure, sand structure, soil formation
- Soils used for construction materials
- Flow through soils, flow nets, permeability testing
- Stresses in soil with depth in a soil deposit
- Effective stresses under conditions of flow
- Consolidation of clay