

1. CEE 4800 – Geotechnical Engineering
2. Course credit hours: 3
Contact hours per week: 3
Credit category: Engineering Topics
3. Course coordinator: Daniel R. VandenBerge
4. Textbook: *Geotechnical Engineering: Principles and Practices*, by Coduto, D. P., Yeung, R. M., and Kitch, W. A. (2011), 2nd Edition, Prentice Hall, Upper Saddle River, NJ, ISBN-13: 0-13-236868-4

Supplemental materials: *NAVFAC Design Manual 7.1 – Soil Mechanics*, Chapters 4 to 6 (provided electronically)

5. Course information:

2020 Catalog description	Soil physical properties, classification, permeability and seepage, consolidation, shear strength and introduction to foundations.
Prerequisite(s) or Concurrent Enrollment	CEE 3030 and GEOL 3210
Course type	Required

6. Course instructional outcomes:

Course Outcome No.	Course Outcome (CO)	ABET Student Outcome
CO1	Have a good understanding of the field of geotechnical engineering	1
CO2	Classify soils for engineering purposes	1
CO3	Calculate basic engineering properties of soils, including weight-volume relationships	1
CO4	Estimate soil permeability and the quantity of water flow through soil	1
CO5	Determine the total stresses, pore water pressures, and effective stresses in a soil mass	1
CO6	Determine stress changes due to foundation loads	1
CO7	Estimate the magnitude of consolidation settlement	1, 2
CO8	Apply the Mohr-Coulomb shear strength criterion to evaluate failure in a soil mass	1, 2
CO9	Calculate bearing capacity and lateral earth pressure of soil	1, 2

ABET criterion 3 Student Outcomes addressed by this course:

SO No.	Student Outcome (SO)
3.1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

3.2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3.5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

7. Course topics:

1. Soil properties, subsurface exploration (10%)
2. Soil classification (10%)
3. Compaction and engineered fill (5%)
4. Flow of water in soil, permeability and seepage, flow nets (15%)
5. Total and effective stress; superimposed load stresses (20%)
6. Consolidation and settlement (20%)
7. Shear strength of soil (15%)
8. Slope stability, bearing capacity, and retaining walls (5%)

Program criteria (curriculum) addressed by this course:

1. Apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science
2. Analyze and solve problems in at least four technical areas appropriate to civil engineering

8. Additional topics, assignments, or requirements for dual-level (4000/5000) course:
N/A

9. Date: 01/28/2020