

1. CEE 4810 (5810) – Foundation Engineering
2. Course credit hours: 3
Contact hours per week: 3
Credit category: Engineering Topics (Significant Design)
3. Course coordinator: Daniel R. VandenBerge
4. Textbook: *Foundation Design: Principles and Practices*, by Coduto, D. P., Kitch, W. A., and Yeung, R. M., (2015), 3rd Edition, Prentice Hall, Upper Saddle River, NJ, ISBN-13: 1-13-341189-3

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

5. Course information:

2020 Catalog description	Soil mechanics (emphasis on stress and shear strength), bearing capacity, magnitude and time-rate of consolidation, geotechnical design of shallow and deep foundations, lateral earth pressure, and geotechnical aspects of retaining wall design.
Prerequisite(s)	CEE 4800
Course type	Selected Elective

6. Course instructional outcomes:

Course Outcome No.	Course Outcome (CO)	ABET Student Outcome
CO1	Evaluate stresses in soil and determine shear strength parameters for foundation design	1
CO2	Calculate ultimate bearing capacity of shallow foundations	1
CO3	Evaluate consolidation settlement, secondary compression, and time-rate of settlement	1
CO4	Size foundations based on both ultimate and serviceability criteria	1, 2
CO5	Investigate different types of retaining walls	1
CO6	Determine lateral earth pressure for design	1, 2
CO7	Calculate stability of gravity, cantilever, and sheet pile retaining walls	1, 2
CO8	Investigate different types of deep foundations	1
CO9	Calculate ultimate bearing capacity and settlement of deep foundations	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
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7. Course topics:

1. Stress in soil and shear strength (5%)
2. Bearing capacity and settlement (25%)
3. Design of shallow foundations (10%)
4. Lateral earth pressure (10%)
5. Design of retaining walls (25%)
6. Design of deep foundations (25%)

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 one technical area appropriate to civil engineering
3. Design a system, component, or process in at least one civil engineering context

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

1. Have a higher grading scale
2. Be expected to perform additional reading and assignments related to special topics in bearing capacity, consolidation settlement, retaining wall design, and deep foundations
3. Complete an individual rather than team project

9. Date: 02/05/2020