

## CIV 410 - Principles of Foundation Engineering

**Current Catalog Description:** The course is designed to provide students with the theory and experience-based knowledge necessary to evaluate and estimate soil properties and earth pressures for analysis and design of retaining walls, anchored bulkheads, and excavation bracing systems. Bearing capacity and settlement of shallow foundations are also covered.

**Prerequisite:** CIV 312 and CIV 330

**Corequisite:** None

**Textbooks and/or Other Required Material:** None

**This course is:** Not Required;  
Technical Elective Option

- Topics Covered:**
1. Review of the main concepts of soil mechanics.
  2. Site characterization, laboratory and field tests, and sampling techniques.
  3. Lateral earth pressure theories.
  4. Design of earth retaining structures.
  5. Design of shallow foundations.
  6. Design of deep foundations.

**Course Learning Objectives:**

Write clear technical memos
Estimate values for various soil properties from in-situ and laboratory tests.
Calculate total and effective vertical stresses in a soil mass due to overburden and external loads.
Estimate lateral earth pressures on retaining walls considering at-rest, active, and passive conditions using different theories.
Proportion retaining walls based on considerations of stability against sliding, overturning, and bearing failure.
Determine allowable bearing pressures for spread footings.
Estimate settlements of spread footings on sandy and clayey soils.
Determine allowable loads for pile foundations using static capacity analysis.

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