



**THE OHIO STATE UNIVERSITY**  
COLLEGE OF ENGINEERING

# Geotechnical Engineering

## CIVILEN 3540

**Credit Hours:**

2.00 - 2.00

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**Course Levels:**

Undergraduate (1000-5000 level)

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**Course Components:**

Lecture

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**Course Description:**

The properties of soils as construction materials (e.g., for earth dams) and as foundations for building are introduced and state-of-the-art numerical techniques for the prediction of seepage and settlement are presented. Contemporary issues such as the impact of soil failure mechanisms and sustainability are covered.

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**Prerequisites and Co-requisites:**

Prereq: MechEng 2020 or 2040, and enrollment in CivilEn or EnvEng or FABEng major. Concur: CivilEn 3541. Prereq or concur: CivilEn 2050 or Stat 3450, 3460, or 3470; or permission of instructor.

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**Course Goals / Objectives:**

- Classify soils according to the USCS system; Discuss Darcy's law & perform groundwater seepage analyses; Discuss Proctor test & its application to field compaction; Estimate the maximum settlement potential and settlement vs time using consolidation
  - theory from lab tests; determine the drained and undrained shear strength properties for ASTM tests such as vane shear, direct shear and triaxial tests.
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**Course Topics:**

- Introduction to soil behavior
  - Phase relationships
  - Index Tests
  - Classification
  - Compaction
  - Seepage
  - Geostatic stresses
  - Mohr Circle
  - Effective stress (
  - Settlement
  - Strength and deformation
  - Stability analysis
  - Earth retaining structures
  - Slope stability
  - Foundation bearing capacity
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**Designation:**

Elective