



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Principles of Foundation Analysis and Design

CIVILEN 5571

Credit Hours:

3.00 - 3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Design methods (classical and numerical) will be presented for the analysis of excavations, earth structures, shallow and deep foundations. The course introduces: site investigation techniques, failure mechanisms and design techniques of footings, drilled shafts, sheet piles, driven piles, anchors, tiebacks, and MSE walls, as well as, stability and settlement calculations.

Prerequisites and Co-requisites:

Prereq or concur: 3540 and 3541; Grad standing; or permission of instructor.

Course Goals / Objectives:

- ? Be able to identify for a specific project the advantages and disadvantages of different foundation systems, and choose the most appropriate one.
 - ? Compute capacities and deflections of various foundation systems including footings, driven piles, drilled shafts, and mat foundations.
 - ? Calculate earth pressures on retaining walls and evaluate the stability of conventional and MSE walls.
 - ? Design retaining walls, braced cuts and deep excavations and laterally loaded geotechnical structures using soldier piles, sheet piles, and slurry walls.
 - ? Use numerical methods in stage-by-stage analyses of earth structures to estimate, displacements, demands, and stability factors of safety.
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Course Topics:

- Site exploration and soil characterization
 - Shallow Foundations: spread and continuous foundations a) bearing capacity b) settlement
 - Shallow Foundations: mat and raft foundations a) differential and total settlements b) modulus of subgrade reaction
 - Deep foundations a) load capacity (axial compression) b) load capacity (uplift) c) load capacity (lateral loads) d) settlement
 - Construction monitoring of deep foundations a) static load tests b) dynamic load tests
 - Soil Improvement methodologies a) physical improvements b) chemical modification
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Designation:

Elective