



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Groundwater Engineering

CIVILEN 5240

Credit Hours:

3.00 - 3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Lab

Course Description:

The role of groundwater in the hydrologic cycle, water supply, construction, and contamination. Includes principles describing subsurface water movement (seepage, saturated, and unsaturated flow). Emphasis on gaining a working knowledge of techniques used in applied engineering practice to estimate groundwater parameters for design purposes. Applications include well design, pumping, and drains.

Prerequisites and Co-requisites:

Prereq: 3130, or Grad standing; or permission of instructor.

Course Goals / Objectives:

- Develop an understanding for solving basic hydrogeological problems
 - Understand how to conduct hydro-geological surveys and analyze pumping test data
 - Design of structures and filter media based on hydrostatic forces and soils criteria
 - Ability to construct groundwater flow models and synthesize findings obtained from simulation models
 - Provide an overview of current issues in the field of groundwater engineering
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Course Topics:

- Groundwater Principles (Water Budget, Soil/Rock Physical Properties, Energy and Head, Principles of Flow, Darcy's Law, Anisotropy, Transmissivity, Conductivity Fractured Flow, Variable Density Flow)
 - Engineering Principles (Flow Nets, Uplift Forces, Effective Stress, Storativity, Matrix Compression, Well Construction, Drilling Techniques, Filter and Drain Design, Slug, Pump Testing, Dewatering)
 - Groundwater Contamination (Groundwater Chemistry, Contamination Sources, Contaminant Fate and Transport, Investigation Contamination, Case Studies)
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Designation:

Elective