



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Civil Engineering Materials

CIVILEN 3510

Credit Hours:

3.00 - 3.00

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Lecture

Lab

Course Description:

Composition and Characterization of civil engineering materials - concretes, asphalts, plastics, fiber-reinforced composites; elastic, plastic, visco-elastic, and failure characterization under various environmental and mechanical loading conditions.

Prerequisites and Co-requisites:

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

Course Goals / Objectives:

- To provide basic understanding of construction practices of the above materials for infrastructure applications
 - To provide hands-on laboratory experience on certain testing procedures and property measurement procedures on aggregates and concrete materials
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Course Topics:

- Introduction to Materials and Property Characterization, and Aggregates Materials, and types: Forces, loads and stresses; Strains and stiffness; Ductility, brittleness, viscoelasticity; Selection of materials, and standards
 - Aggregates: Some common rocks and rock minerals; Types of aggregates; Property characterization, and testing
 - Concrete Materials: Types of cements; Portland cements; Hydration and properties of fresh and hardened concretes; Durability of concretes; Mix proportioning and design; Admixtures for concretes
 - Bituminous Materials and Mixtures, and Plastics and composites: Tars, pitches, and asphalts; Petroleum Asphalts; Properties of Asphalts; Asphalt Grades; Asphalt Concretes
 - Asphalt Pavements: Types of Plastics; Types of Composites; Properties of Plastics and Composites; recyclability, sustainability, and durability of materials
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Designation:

Required