



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Probabilistic Applications and Data Interpretation in Civil and Environmental Engineering

CIVILEN 2050

Credit Hours:

3.00 - 3.00

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Lecture

Course Description:

Fundamentals of probability and statistical analysis for applications and data interpretation in Civil and Environmental Engineering design and analysis.

Prerequisites and Co-requisites:

Prereq: Enrollment in CivilEn or EnvEng major.

Course Goals / Objectives:

- Be skilled in the mathematics and interpretation of basic probability and statistics
 - Be able to represent Civil and Environmental Engineering problems in probabilistic terms
 - Understand the concept of Monte Carlo simulation and be able to generate discrete distributions of random variables using Monte Carlo simulation for some Civil and Environmental Engineering problems
 - Be able to effectively communicate analysis, results, and conclusions in written form
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Course Topics:

- (1) Fundamentals of mathematical probability: events, Venn diagrams, intersections and unions, conditional probability, joint probability, probabilistic independence, Bayes theorem, discrete and continuous distributions
 - (2) Fundamentals of descriptive statistics: measures of central tendency and dispersion; moments of distributions
 - (3) Selected probability distributions: Bernoulli, binomial, geometric, Poisson, exponential, normal, log-normal
 - (4) Fundamentals of Monte Carlo simulation
 - (5) Documenting and communicating numerical analysis
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Designation:

Required