



Course Name:

Structural Reliability and Probabilistic Modeling

Course Number: 20-130	Credit: 3
Program: Graduate	Course Type: Technical Selective
Prerequisite: -	Corequisite: -

Course Description (Objectives):

This course aims to familiarize students with uncertainties in engineering, including probabilistic modeling, reliability analysis, and risk-based logical decision-making.

Course Content (outline):

- Chapter 1: Introduction and Background
- Chapter 2: Decision Analysis
- Chapter 3: Probabilistic Modeling
- Chapter 4: Introduction to Stochastic Processes and Random Fields
- Chapter 5: Reliability Analysis
- Chapter 6: Introduction to Response Surfaces and Neural Networks
- Chapter 7: Multi-Hazard Risk Analysis
- Chapter 8: Code Calibration

References:

- Haldar and Mahadevan (1999), Probability, Reliability, and Statistical Methods in Engineering Design, Wiley
- Der Kiureghian (2005), First- and Second-order Reliability Methods. Chapter 14 in Engineering Design Reliability
- Handbook, Edited by Nikolaidis, Ghiocel, and Singhal, CRC Press
- Melchers (1999), Structural Reliability: Analysis and Prediction, Prentice Hall