

Course Name:

Numerical Methods in Structural Analysis

Course Number: 20-148	Credit: 3
Program: Graduate	Course Type: Technical Selective
Prerequisite: -	Corequisite: -

Course Description (Objectives):

The main objective of this course is to study structural theory and dynamics with a focus on beams and plates. It emphasizes the use of numerical methods to obtain approximate solutions to governing differential equations, analyze linear and nonlinear structural dynamics, and determine eigenvalues.

Course Content (outline):

- Chapter 1: Introduction and classification of physical problems in one-dimensional and two-dimensional structures
- Chapter 2: Introduction of multi-degree-of-freedom modeling methods for beams
- Chapter 3: Introduction of compatible separate element methods
- Chapter 4: Introduction of finite difference methods
- Chapter 5: Introduction to the Ritz and Galerkin methods
- Chapter 6: Introduction to the calculus of variations in deriving governing equations for beams
- Chapter 7: Numerical solution of differential equations governing structural problems
- Chapter 8: Application of numerical solutions of differential equations in structural dynamics problems
- Chapter 9: Introduction to eigenvalue problem solving

References:

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