



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Applied Finite Element Method

MECHENG 5139

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate

Course Components:

Lecture

Lab

Course Description:

Overview of finite element method, description of finite element software, modeling requirements and techniques, analysis using general purpose software, and case studies.

Prerequisites and Co-requisites:

Prereq: 2020 or 2040 or equiv, and enrollment in MechEng major; or Grad standing in Engineering.

Course Goals / Objectives:

- Introduce students to the concept of solving complex engineering problems using discretization and numerical methods
 - Develop a working understanding of commercial finite element codes
 - Be able to select appropriate element types, analysis types, and boundary conditions to approximate real-world problems
 - Be able to interpret the results of finite element simulations and use simple hand calculations to assess whether their simulations are reasonable
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Course Topics:

- Introduction to the Finite Element Method
 - Linear Static Analysis using 1D, 2D, and 3D Elements
 - Boundary Conditions and Modeling Techniques
 - Stress Measures and Failure Theories
 - Modal Analysis
 - Steady State and Transient Heat Transfer Analysis
 - Nonlinear Finite Element Topics
 - Design Optimization using ANSYS
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Designation:

Elective