



Vibration of Continuous Systems

MECHENG 8250

Credit Hours:

3.00 - 3.00

Course Levels:

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Analysis of one, two and three dimensional continuous vibratory systems including strings, beams, membranes, plates and shells using exact and approximate methods with various boundaries.

Prerequisites and Co-requisites:

Prereq: 4030 (430) or 7250 (731), and Math 2255 (255) or equiv; or permission of instructor.

Course Goals / Objectives:

- Learn analytical methods for analyzing continuous vibratory systems
 - Examine approximations associated with computational and simplified theoretical methods
 - Examine the role of various boundary conditions on natural modes
 - Apply modal analysis concepts to real-life vibration problems
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Course Topics:

- Equations of motion of one-dimensional systems such as strings in tension and beams in axial, torsional and bending vibrations.
 - Equations of motion of two-dimensional systems such as membranes, thin plates.
 - Eigenvalue problem and natural modes for various boundaries.
 - Response to initial conditions and harmonic or periodic excitations.
 - Equations of motion of three-dimensional shells of revolution.
 - Wave propagation in elastic media.
 - Modeling of continuous systems using approximate methods such as finite elements.
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Designation:

Elective