Course ME 56300 – Mechanical Vibrations

Type of Course Required for MSE-ME concentration


Credits 3

Contact Hours 3

Prerequisite Courses ME25100, Graduate Standing

Corequisite Courses None

Prerequisites by Topics Dynamics, Calculus, Differential Equations, Linear Algebra


Course Objectives To introduce intermediate vibration theory, its applications, and analysis techniques.

Course Outcomes Students who successfully complete this course will be able to:

1. identify vibration problems of a mechanical system, (1, 7)
2. construct a mathematical model and find analytical/numerical solutions, (1, 7)
3. implement the solutions to improve the design and performance of the system. (1, 7)

Lecture Topics

1. Review of systems with one degree of freedom
2. Lagrange’s equations of motion for multiple degree of freedom systems
3. Principle frequencies and modes
4. Transfer functions for harmonic response, impulse response, and step response analysis
5. Convolution integrals for response to arbitrary inputs
6. Distributed parameter systems  
7. Approximation techniques  
8. Introduction to nonlinear problems

**Computer Usage**  
Low

**Laboratory Experience**  
None

**Design Experience**  
Low

**Coordinator**  
Bongsu Kang, Ph.D.

**Date**  
27 March 2018