



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Automotive Noise and Vibration Control II with Lab

MECHENG 7263

Credit Hours:

4.00 - 4.00

Course Levels:

Graduate

Course Components:

Lecture

Lab

Course Description:

Integrated study of vibrations, acoustics, signal processing and dynamics based on case study approach; continuation of 7260 with focus on experimental and design methods.

Prerequisites and Co-requisites:

Prereq: 7260 or 777, or Sr or Grad standing, or permission of instructor.

Course Goals / Objectives:

- Learn analytical, computational and experimental methods for analyzing automotive noise and vibration (NVH) problems, based on an integrated approach. (Continuation of 7260)
 - Examine dynamic and acoustic issues involved in the design of contemporary vehicles
 - Apply concepts to real-life vehicle and machinery noise and vibration control problems
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Course Topics:

- Vehicle modal analysis: Eigenvalue problems, modal domain properties; 1/2, 1/4 and full car models; drivetrain dynamics and torsional models.
 - Frequency response and vibration control: Vibration absorber concept and vehicle applications; beam experiment; frequency response methods.
 - Modal testing and beam vibrations: Material selection issues and boundary conditions; beam vibrations; 2-channel processing; modal testing procedures; visco-elastic damping and modal radiation; operating deflection surveys;
 - Advanced topics: Mobility synthesis method; lumped parameters and 3-D acoustic models; acoustic intensity; vehicle noise sources;
 - Appropriate case studies: Body/frame vibrations; induction & exhaust systems, acoustic boom, squeak & rattle models, dynamic absorbers; dynamics of machine elements, etc.
 - Group discussion topics: Experts from industry discuss key issues.
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Designation:

Elective