Goals:
This is the first of a series of two courses on Vibroacoustics, with emphasis on modern theory, experimental and numerical tools to solve practical problems in noise, vibration and harshness. The objective of these courses is to provide the student with a unified approach to study noise and vibration with particular emphasis on the interactions between sound waves and solid structures. This course offered in Fall semester deals with advanced concepts in Vibration & Noise Control with emphasis on analytical and computational tools.

Prerequisites
MEEM 3700, 4701, 4704 or Graduate Standing

Textbook and Other Required Materials
No Formal Text is prescribed. The Instructor provides the notes for this course.

Suggested Reference Books.

Topics Covered


Duct Acoustics: Acoustics of Filters and Muffler Elements, Sound in Reverberant Spaces
& Reverberation Time, Helmholtz Resonators and Plenum Chambers.

Sound Radiation and Radiation Models: Monopoles, Dipoles & Quadrupole, Physical Description and Examples of Sources, Interactions Between Sound Waves and Solid Structures. Radiation Ratio.

Statistical Energy Analysis (SEA), Acoustic Reciprocity & Noise Path Analysis. (NPA)

Acoustic Intensity (AI), Vibration Damping and Sound Quality Concepts.

Introduction to Finite Element Method for Vibration Analysis.

Recent Topics of Interest.

**Grading:**
Based on your cumulative performance in weekly homework, mid-term and final exam.

HW: 70%; Mid-Term: 15%; and Finals: 15%

The following grading scheme will be used.

There will be regular Home Work assigned in class. Late HW submission is strongly discouraged unless supported with a valid reason. However, any HW submitted one week after it was due would not be graded. Please follow instructions given in class in the preparation of each HW report.