

AE/ME 6760: Acoustics I

- Credit Hours: 3-0-3
- Prerequisites: Math 2403 or MATH 2413 or MATH 24X3 or equivalent
- Catalog Description: Fundamental principles governing the generation, propagation, reflection, and transmission of sound waves in fluids.
- Textbooks: Allan D. Pierce, *Acoustics: Introduction to Physical Principles and Applications*, 1st Edition, Springer-Verlag, 1989 (an Acoustical Society publication).
- Goals: The goal of this course is to expose students to an in-depth understanding of the fundamental principles governing the generation, propagation, reflection, and transmission of sound waves in fluids.
- Topics:
- Fundamentals
 - Governing equations
 - Sound speed
 - Energy, intensity
 - Coherent and incoherent sound sources
 - Acoustic power
 - Plane, spherical sound waves
 - Spectral analysis, decibels, frequency weighting
 - Reflection and Transmission of sound waves
 - Acoustic impedance
 - reflection/transmission between two fluids
 - reflection at an impedance boundary
 - standing wave tube
 - radiation from a vibrating infinite plate
 - transmission through a wall, a layer
 - Ideal sources
 - pulsating sphere, translating sphere
 - monopoles, dipoles, quadrupoles
 - multipole expansions, spherical harmonics