

Course Number: 28372

Course Name: Engineering Acoustics

Course Type:
Prerequisite:
Level: Graduate
Group: Marine engineering

Type & Max Unit: 3
Corequisite:
First Presentation:
Last Edition:

Objectives:

The objective is to introduce the fundamental concepts of acoustical analysis to engineers and especially to study wave propagation, sound radiation, absorption and transmission in a manner directly relevant to modern noise control practice.

Topics:

- Mechanical Vibration of Simple Systems: Fundamentals of Vibration; Transverse Waves on a String; The One-Dimensional Wave Equation and its Solution; Reflection at a Boundary; Forced Vibration of an Infinite String; Forced Vibration of a String of Finite Length; Normal Modes; Two-Dimensional Wave Equation; Vibration of Membranes and Plates
- Acoustic Wave Equation and its Simple Solutions: The Equation of State; The Equation of Continuity; The Simple Force Equation; The Linear Wave Equation; Speed of Sound in Fluids; Harmonic Plane Waves; Energy Density; Acoustic Intensity; Specific Acoustic Impedance; Spherical Waves
- Reflection and Transmission: Normal Incidence; Transmission Through a Fluid Layer; Oblique Incidence
- Radiation: Radiation from a Pulsating Sphere; The Continuous Line Source; Radiation from a Plane Circular Piston
- Sound Propagation: Sound Propagation in Ducts, Sound Propagation in rooms
- Underwater Acoustics: Speed of sound in Seawater; Transmission Loss; Refraction

References:

- Kinsler, L.E., A.R. Fery, A.B. Coppens and J.V. Sanders, "**Fundamentals of Acoustics**", 4th ed., Wiley, 1999.
- Fahy, F., **Foundations of Engineering Acoustics**, Academic Press, 2001.
- Ver I. L., L.L. Beranek, **Noise and vibration control engineering: principles and applications**, Wiley, 2006.