Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NMED508	Acoustics and Noise control	3	0	0	3

Course Objective

• Noise and Harshness has become a major issue in today's society, which calls for a quitter technology.

• This course will be extremely useful for engineers and researchers to design quitter machines or machine components.

Learning Outcomes

Upon successful completion of this course, students should be able to:

- Understand the concept of technical acoustics
- Apply the concept in solving industrial problems
- Develop software code for a proper mathematical modeling
- Identify a suitable research topic to solve realistic industrial problem

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Fundamentals of vibration, Sound and vibration, Acoustics and engineers, basics of acoustics, dB levels, Concept of acoustic impedance etc. Octave bands.	08	Basics of vibration and acoustics. Various acoustic terminologies.
2	Type of waves, Characteristic of waves, Mathematical models of sound waves, 3D Wave equation.	06	Acoustic wave phenomena and developing various mathematical models.
3	Acoustics of cavity, Helmholtz resonator, noise control techniques, Noise Control Application, Acoustics of Mufflers etc.	08	Different types of noise control techniques and devices.
4	Experimental Techniques, Source Modeling, Acoustic Structure Interaction, Sound Radiation from Vibrating Plate.	08	How sound interact with different structures and quantifying sound radiation from the structure at a point.
5	Vibration and acoustics measuring instruments. Types of Microphones and specifications.	06	Introducing sensors to pick up vibration/acoustic signals and their analysis.
6	Wavenumber space, K-Space Diagram, Concept of Angular Spectrum, Green's function, Rayleigh Integral, Velocity and far field pressure calculations, Directivity and Sound power calculation.	06	Learning various mathematical techniques to predict sound power level at a distance from the source.
Total		42	

Text Books:

1. M. L. Munjal. Noise and Vibration Control, World Scientific Press: Singapore (2014).
2. Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens and James V. Sanders. Fundamentals of Acoustics, Wiley: New York (1999).

References Books:

1. Uno Ingard. Notes on Acoustics, Firewal Media: Delhi (2010).
2. E. G. Williams. Fourier Acoustics: Sound Radiation and Near Field Acoustic Holography, Academic Press: New York (1999).
3. Acoustics of Ducts and Mufflers, 2nd Edition, M. L. Munjal, John Wiley and Sons, ISBN: 978-1-118-443125. (2014).

Course	Course	Name of Course	L	T	P	Credit