

Course Type	Course Code	Name of Course	L	T	P	Credit
DP	NMEC511	Mechanical Vibration Lab	0	0	3	1.5

Course Objective

- To introduce the concept of Mechanical Vibrations and noise
- To learn the working principles of different instruments used to measure vibration and noise

Learning Outcomes

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

- To understand the vibration phenomena of structure and machine
- Can determine the natural frequency of structures
- Can understand the resonance phenomena
- Monitoring the condition of the machine and bearing

ExpNo.	Topics to be Covered	Contact Hours	Learning Outcome
1	Free Vibration of Cantilever Beam System	3	Ability to determine natural frequencies
2	Forced Vibration of a Cantilever Beam	6	To measure force vibration frequency using force vibration apparatus and understand the resonance
3	Calculation of damping using a simple pendulum	6	Ability to determine the damping coefficient
4	Modal Analysis of Cantilever Beam	3	Understand the mode shape of structures
5	Whirling of shaft	3	Find out the critical speed of whirling to avoid buckling or failure
6	Measurement of noise under different conditions	3	Ability to noise measurement
7	Cepstrum analysis for Machine Fault Identification	3	Understanding the uses of Cepstrum for condition monitoring and computing Cepstrum of a signal
8	Envelope Analysis for the Fault Detection	6	Understanding the uses of Hilbert envelope for condition monitoring and computation of the envelope of a signal
9	Study of Kurtosis as a Machine Condition Indicator	3	To see the changes in the Kurtosis value of a vibration signal due to faults in machinery
10	Study of resonance of vibrating	3	Ability to determine resonance

	feeder structure		frequency and the phenomena
11	Study of vibration in coil spring	3	To determine frequencies of coil spring
Total		42	

Text Books:

1. Theory of vibrations with applications – W. T. Thomson, M.D. Dahleh, C Padmanabhan, Pearson, 5th Edition. (2008)

References Books:

1. Vibration: Fundamentals and practices, Clarence W.de Silva; CRC press, 2nd Ed.2006.
2. Vibration and noise for engineers – K. Pujara; DhanpatRai and Co,2013.