

INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	Mechanical Vibrations
2.	Course Number	ME5021
3.	Status of the Course	Core
4.	Structure of Credits	3-0-0-3
5.	Offered To	PG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Mechanical Engineering
8.	To take effect from	July 2018
9.	Prerequisite	Engineering Mechanics
10.	Whether approved by the Department	Yes
11.	Course Objective: The primary objective of this course is to enable students to build and solve mathematical models of discrete vibrating systems. The emphasis is on single and multi-DOF linear systems subject to initial conditions and excitations of sinusoidal and periodic nature. The course introduces the concept of frequency response functions and Lagrange's equations.	
12.	Course Content: Newton's laws –Modelling of mechanical systems - Equivalent spring mass dampers – Equations of motion – Vibration about equilibrium points –Viscous and Coulomb Damping – Response of 1DOF system to harmonic and periodic excitations – Superposition– Response to non-periodic excitations – Properties of Mode shapes - Coordinate transformations - Modal analysis of two and multi DOF systems subjected to initial conditions and excitations – Frequency response functions (FRFs) - Lagrange's equations - Vibrations of Torsional and gear systems- System with proportional damping	
13.	Text book(s): 1. Meirovitch L., <i>Fundamentals of Vibrations</i> , McGrawHill, (2001).	
14.	Reference(s): 1. Hartog J.P.D., <i>Mechanical Vibration</i> , Dover Publications, (2000).	