

1.	Title of the course	Vibrations of Discrete Systems
2.	Course number	ME525L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To ME5105/16
6.	To be offered by	Department of Mechanical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	<b>Course Objective(s):</b> To build and solve mathematical models of discrete vibrating systems. To estimate responses of single and multi degree-of-freedom (DoF) linear systems subject to initial conditions and external excitations. To introduce time and frequency domain methods.	
10.	<b>Course Content:</b> Modelling strategies, linearization of non-linear systems, static equilibrium, stability about equilibrium points; Single DoF system, equivalent spring mass dampers, Newton's method for equations of motion, viscous and Coulomb damping, system with proportional damping; Response to initial conditions and excitations, superposition, response to non-periodic excitations; Properties of mode shapes, coordinate transformations, response of two and multi DoF systems subjected to initial conditions and excitations; Transfer function method, frequency response functions (FRFs); Lagrange's equation of motion; Computational methods for vibration analyses.	
11.	<b>Textbook(s):</b> 1. Meirovitch L, <i>Fundamentals of Vibrations</i> , 1st Edition, McGrawHill (2001). 2. Rao S S, <i>Mechanical Vibrations</i> , 5th Edition, Prentice Hall (2010).	
12.	<b>Reference(s):</b> 1. Hartog J P D, <i>Mechanical Vibrations</i> , 1st Edition, Dover Publications (2007). 2. Ramamurti V, <i>Mechanical Vibration Practice with Basic Theory</i> , 1st Edition, Alpha Science (2000).	