No.	**Information of every subject**	
1	Unit name:	Vibration and Control
2	Code:	ME-51015
3	Classification:	Engineering Subjects
4	Credit value:	3
5	Semester/ Year Offered:	1/2
6	Pre-requisite:	Differential Calculus Dynamic of Machinery
7	Mode of delivery:	Lecture, Tutorial
8	Assessment system and breakdown of marks:	
	Tutorial (Will be assigned depending on course progress)	20%
	Mid-term Examination	40%
	Final Examination	40%
9	Academic staff teaching unit:	
10	**Course outcome of unit:** In this course, students will be able Semester I ❖ To be learn fundamental information about the vibration phenomenon ❖ To be gained skills of modelling of vibration problems encountered in application and examining vibration response, establishing relation between real system and physical model ❖ To be formed mathematical model, methods used examining of vibrations and its usage fields ❖ To find out the solution of mathematical model and to be interpreted of its results	

	❖ To be having general information about definition and finding remedy of the vibration problems encountered in machineries	
11	**Synopsis of unit:** It is expected from the students that they come out with the following knowledge at the end of this course; ➢ Can classify the system of vibration. ➢ Understood the parameters and variables of a vibration system. ➢ Can represent the vibration phenomena as a mathematical model and solve it to obtain the response. ➢ Can analyze the free and force vibrating system according to the degree of freedom. ➢ Familiarize students with the use of MATLAB as directed toward vibration problems.	
12	**Topics:**	
	Chapter	
	1	**Fundamentals of Vibration and Important of the Study of Vibration** 1.1 Preliminary Remarks 1.2 Brief History of the Study of Vibration 1.3 Importance of the Study of Vibration 1.4 Basic Concepts of Vibration 1.5 Classification of Vibration 1.6 Vibration Analysis Procedure 1.7 Spring Elements 1.8 Mass or Inertia Elements 1.9 Damping Elments

		1.10 Harmonic Motion
		1.11 Harmonic Analysis 1.12 Examples using MATLAB
	2	**Free Vibration of Single Degree of Freedom** 2.1 Introduction 2.2 Free Vibration of an Undamped Translational System 2.3 Free Vibration of an Undamped Torsional System 2.4 Response of First Order Systems and Time Constant 2.5 Rayleigh's Energy Method 2.6 Free Vibration with Viscous Damping
	3	**Harmonically Excited Vibration** 3.1 Introduction 3.2 Equation of Motion 3.3 Response of an Undamped System Under Harmonic Force 3.4 Response of a Damped System Under Harmonic Force 3.5 Response of a Damped System Under F(t) 3.6 Response of a Damped System Under Harmonic Motion of the Base 3.7 Response of a Damped System Under Rotating Unbalance
	4	**Vibration Under Forcing Condition** 4.1 Introduction 4.2 Response Under a General Periodic Force 4.3 Response Under a Periodic Force of Irregular Form 4.4 Response Under a Non-Periodic Force

		4.5 Convolution Integral
	5	**Two Degree of Freedom System** 5.1 Introduction
		5.2 Equations of Motion for Force Vibration 5.3 Free Vibration Analysis of an Undamped System 5.4 Torsional System 5.5 Coordinate Coupling and Principal Coordinates 5.6 Force Vibration Analysis 5.7 Semidefinite Systems
	6	**Vibration Control** 6.1 Vibration Isolation 6.2 Vibration Isolation System with Rigid Foundation 6.3 Vibration Isolation System with Base Motion 6.4 Vibration Isolation System with Flexible Foundation 6.5 Vibration Absorber 6.6 Undamped Dynamic Vibration Absorber 6.7 Damped Dynamic Vibration Absorber
13	Main references: Mechanical Vibration by Singiresu S. RAO, Fifth edition.	
14	Additional references: ME-5015,VIBRATION AND CONTROL (Textbook) William T.Thomson, “Theory of Vibration with Applications”, Prentice Hall,1988 William Weaver, Jr, “Vibration and Problems in Engineering”, John Wiely and SONS, 1990	