MACHINE DYNAMICS LAB

Course Code	20ME3653	**Year**	III	**Semester**	II
Course Category	Program Core	**Branch**	ME	**Course Type**	Lab
Credits	1.5	**L-T-P**	0-0-3	**Pre-requisites**	Nil
Continuous Internal Evaluation	15	**Semester End Evaluation**	35	**Total Marks**	50

Course Outcomes: Upon successful completion of the course, the student will be able to

COs	**Statement**	**Skill**	**BTL**	**Expts.**
CO1	Evaluate the natural frequencies in different vibrating systems and the effect of gyroscopic couple	Analyze	L4	1,2,3,12
CO2	Compute the radius of gyration & Moment of Inertia of the oscillating part in the vibration system	Analyze	L4	4,5
CO3	Test for amplitude and damping coefficient in damped and undamped vibrating systems	Analyze	L4	6,7,8
CO4	Verify the static and dynamic balancing and determination of whirling speeds of shaft	Analyze	L4	9,10,11

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3-High, 2: Medium, 1: Low)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	2	3						1			3	2
CO2	3	3	2	3						1			3	2
CO3	3	3	2	3						1			3	2
CO4	3	3	2	3						1			3	2

Syllabus

Expt. No	**Contents**	**Mapped CO**
1.	Determination of Natural frequency of single mass, single helical spring system.	CO1
2.	Determination of Natural frequency of the combination of springs – springs in parallel or springs in series.	CO1
3.	Determination of Natural frequency of undamped torsional single rotor system.	CO1
4.	Determination of radius of gyration of a given compound pendulum.	CO2
5.	Determination of radius of gyration, a moment of inertia – bifilar suspension Method.	CO2
6.	To find the Damping coefficient of the torsional single rotor system.	CO3
7.	Determination of amplitude of vibration of a damped vibrating system.	CO3
8.	Determination of amplitude of vibration of an undamped vibrating system.	CO3
9.	Verify the Static balancing using a steel ball.	CO4
10.	Verify the Dynamic balancing using steel balls.	CO4
11.	Whirling of shafts/ determination of critical speed with Rotors.	CO4
12.	Gyroscopic couple verification.	CO1

Learning Resources

Text Books:

Theory of Machines, (4th Edition) by S.S.Rattan ,Tata Mc.Graw Hill, New Delhi, 2014.

Mechanical vibrations, (4th edition) by Singiresu S. Rao Pearson education publications, Delhi, 2004.
Reference Books: Theory of Machines, (5th Edition) by R.K.Bansal, Laxmi Publications(p) ltd. New Delhi, 2010