Approval: 10th Senate Meeting

Course Number: ME312P

Course Name: Design Lab - 2

Credits: 0-0-2-1

Prerequisites: ME 309 Theory of Machines

Intended for: B-Tech, Mechanical

Distribution: Core

Semester: Odd/Even

Preamble: The basic objective of this lab is to introduce students to kinematic and dynamic behaviour of common machine elements and mechanisms. Students should be able to do basic calculation for force, moment and motion analysis of mechanical systems. The lab also introduces students to journal bearing, gyroscope, balancing of engines, whirling speed of shaft etc.

List of Experiments:

1. Fatigue test.
2. Synthesizing a simple mechanism to produce given out put motion.
3. Balancing of engines.
4. (a) Study of performance of different types of governors.
   (b) Study of Gyroscope and precessional motion
5. Generating involute profile with a rack.
6. Study of gear trains and gear boxes.
7. Studying follower motion with different types of cam profiles.
8. Whirling speed of a shaft.
9. Forced damped vibrations.
10. Torsional vibrations with and without damping.
11. Transmissibility of vibrations to the support.
12. Use of piezo-sensors for sensing the deformation.
13. Use of strain gauges, deformation of thin cylinders.
14. Pressure distribution in a journal bearing.

Text Books:

1. A. Ghosh, A. K. Mallik, Theory of Mechanisms and Machines, East West Press Pvt. Ltd.
2. Uicker, J. J., Shigley, J. E., and Pennock, G. R., Theory of Machines and Mechanisms, Oxford University Press.
3. Thomas Bevan, Theory of Machines, Pearson

Reference:

1. C. E. Wilson, J. P. Sadler, Kinematics and Dynamics of Machinery, Pearson.
2. R. L. Norton, Design of Machinery, McGraw Hill Company