Course Type	Course Code	Name of Course	L	T	P	Credit
DP	MEC 204	**Applied Mechanics Lab**	0	0	2	2

Course Objective

- The course is focused on basic understanding of different parts of Machines and Mechanisms and some validation of Solid Mechanics theories which provide a foundation for the study of machine design.

Learning Outcomes

Upon successful completion of this course, students will:

- have a clear understanding of different mechanism, motion of machines.
- be able to understand the design procedure of different mechanical system like gear, cam, belt, brake, etc.

Unit No.	Topics to be Covered	Laboratory	Learning Outcome
1	Coefficient of friction between sliding belt (rope) and a fixed pulley	1	To visualize the effect of sliding friction and also to quantify the coefficient of friction.
2	Efficiency of a screw jack by raising and lowering conditions	1	To know how to obtain the mechanical advantages of screw jack system during raising and lowering the load.
3	Cam profile and follower movement	1	Understanding the procedure of laying out a cam profile given a follower displacement diagram.
4	Coriolis component of acceleration	1	To visualize the effect of Coriolis component and also to validate using hydraulic analogy.
5	Epicyclic gear train and torque holding	1	To measure the input torque, holding torque and output torque.
6	Tensile Testing of a cylindrical mild steel specimen	1	To measure the yield strength, ultimate strength, breaking strength, % of elongation and the stress-strain behavior of a mid-steel material subjected to tensile loading.
7	Compression Testing of a cylindrical cast iron specimen	1	To measure the compressive strength of the material and the fracture behavior of the material under compressive load.
8	Impact testing (Izod and Charpy) of a mild steel material.	1	The aim of this test is to understand the toughness of the materials. This test suggests the ability of the material to absorb the energy during the plastically deformed.
9	Hardness testing (Brinell and Rockwell) of the materials	1	To measure the resistance of the material surface indicating the strength or the hardness of the metallic materials.
10	Spring testing	1	To measure the stiffness of the helical spring under compressive and tensile loading. The shear modulus of the spring materials can be also be estimated.

11	Torsional test of a cylindrical shaft	1	To measure the torsional rigidity, shear modules of a material. Understanding the torsional behavior of the materials

Reference Books:

1. Theory of Machines and Mechanisms-John Uicker, Gordon Pennock, Joseph Shigley
2. Theory of Machines-S.S.Rattan
3. Elements of Strength of Materials by S.P. Timoshenko & D.H. Young
4. Strength of Materials Lab Manual by Anand Jayakumar Arumugham