Course Type	Course Code	Name of Course	L	T	P	Credit
DP 6	MEC 305	Machine design Lab	0	0	3	3

Course Objective

- The objective of this course is to develop an ability to design a machine component commonly found in mechanical devices and systems.

Learning Outcomes

After completing the course, students will be able to

- use readily available materials, processes and appropriate design approaches to achieve a safe, efficient design.
- execute original designs for machine elements and integrate the elements into a system composed of several elements.
- work professionally in the machine design area.

Module	Topics	Laboratory	Learning Outcome
1	Design of shaft	1	Ability to propose reasonable geometries for shafts to carry a variety of types of power-transmitting elements, providing for the secure location of each element and the reliable transmission of power.
2	Design of a rigid coupling	1	Ability to design rigid coupling for power transmission
3	Design of a flexible coupling	1	Ability to design flexible coupling for torque transmission
4	Design of helical spring	1	Ability to design helical compression springs to conform to design requirements such as force/deflection characteristics, life, physical size, and environmental conditions.
5	Design of leaf spring	1	Ability to design leaf spring defining the geometry of leaves.
6	Design of brake	1	Ability to determine the minimum required actuating force, and friction torque for the proposed brake package.
7	Design of clutch	1	Ability to design plate clutch to drive a system.
8	Design of journal bearing	1	Ability to design full-film bearings, defining the size of the journal and bearing, the diametral clearance, the bearing length, the minimum film thickness, the surface finish, the lubricant, and the resulting frictional performance of the bearing system.
9	Selection of rolling element bearing	1	Ability to select type and specification of the rolling bearing from the manufacturer's catalogue for a given application
10	Design of spur gear	1	Ability to complete the design of the gears (Spur, Helical, and Bevel), taking into consideration both the stress analysis and the analysis of pitting resistance. The result will be a complete specification of the gear geometry, the material for the gear, and the heat treatment of the material.
11	Design of helical gear	1	
12	Design of bevel gear	1	
13	Evaluation	1	Evaluating the understanding of the course by the students.

Text Books:

1. Machine Design Databook, K Lingaiah

Reference Books:

1. Mechanical Engineering Design, J. E. Shigley, Mischkee& R. Charles
2. Design of Machine Elements, M. F. Spotts& T. E. Shamp.
3. Machine Design, Robert L. Norton.
4. Machine component Design, R C Juvinall, Kurt M. Marshek
5. Relevant Indian Standards