Course Type	Course Code	Name of Course	L	T	P	Credit
DC	MEC301	Machine Design	3	0	0	9

Course Objective

- To develop an ability to apply knowledge of mathematics, science, and engineering to design a system, component, or process to meet desired needs within realistic constraint.
- To develop an ability to use the techniques, skills, and modern engineering tools necessary for engineering practices.

Learning Outcomes

Upon successful completion of this course, students will:

- have a understanding of phases and interactions of the design process.
- be able to make decision with too little information or with an excess of partially contradictory information.
- be able to take into account safety and environmental issues when selecting and/or designing a mechanical components.
- be able to design various mechanical components.
- be able to communicate effectively and work with people of many discipline.
- be able to work professionally in mechanical design area.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Philosophy of engineering Design, Mechanical engineering design, Design process, Design considerations, Factor of safety Codes and Standards. Material selection.	5	Understanding of various design considerations, basic principles of machine design, factor of safety and material selection requirements.
2	Design static loading; Modes of failure, Stress concentration, failure theories, Selection of failure criteria, Fracture mechanics	5	Understanding of static loading for designing machine elements, stress analysis and theories of failure.
3	Design for dynamic loading; Endurance limit and fatigue strength, stress concentration and notch sensitivity, fatigue failure criteria. Surface damage, Wear, contact stresses	7	Understating of dynamic loading, design of machine elements on the basis of strength/ rigidity concepts, stress analysis and failure criteria.
4	Design of Joints: bolted, riveted and welded joints.	5	Designing of bolted, riveted and welded joints and their limitations.
5	Design of Shaft, couplings, springs. brakes and clutches.	8	Ability to design shaft, couplings, springs, brakes and clutches for a particular application.
6	Selection of Rolling contact Bearing, Lubrication and slider bearing, design of journal bearing.	7	Ability to select different types of rolling bearing, from the manufacturers catalogue andabilty to design sliding bearing.
7	Design of gears : Spur gear, helical gear, Bevel gear.	5	Ability to design gears for a particular application.

Text Books:

1. Mechanical Engineering Design, J. E. Shigley, Mischkee& R. Charles

Reference Books:

1. Design of Machine Elements, M. F. Spotts& T. E. Shamp.
2. Machine Design, Robert L. Norton.
3. Machine component Design, R C Juvinall, Kurt M. Marshek
4. Design Data Hand Book, PSG College of Technology.
5. Relevant Indian Standards