Course Type	Course Code	Name of Course	L	T	P	Credit
DC 3	MMC 203	DESIGN OF MACHINE ELEMENTS	3	1	0	11

Course Objective
The objective of the course is to present the fundamentals of design of machine elements.
Learning Outcomes
Upon successful completion of this course, students will: • have a fundamental understanding of machine design. • be able to analyze theory of failure and static-fatigue loading. • be able to make basic design of different joints, connecting shafts and coupling, different drives and bearing.

Unit No.	Topics to be Covered	L+T	Learning Outcome
1	Introduction to Engineering Design: Philosophy of engineering Design, mechanical engineering design, design process, design considerations, codes and standards, Manufacturing consideration in design, Limits and fits, Selection of Materials.	6+2	Philosophy of design, material selection,
2	Principles of mechanical design: Factor of safety, strength, rigidity, fracture, wear, Stress concentrations, Theories of failure, Design against static load.	4+2	Understanding and analyzing theory of failure.
3	Design against Fluctuating load; Fatigue failure, endurance limit, notch sensitivity, design for finite and infinite life, cumulative damage in fatigue.	7+2	Understanding and analyzing effect of fluctuating load on design methodology.
4	Design of joints: Design procedures for Cotter joint, Knuckle joint, Levers and Links, Riveted joint, Welded joint, Power Screw and Threaded joint.	8+2	Understanding and analyzing design of different joints in mechanical system.
5	Design of Shafts, keys and couplings.	6+2	Understanding and analyzing design of short distant power transmission elements.
6	Design and selection of Belt and chain drives.	3+1	Understanding and analyzing design of long distant power transmission elements.
7	Design of brakes and clutches	3+1	Understanding and analyzing design of braking and powering devices.
8	Bearings: Classification, application and selection steps for sliding contact and rolling elements bearings, lubricants and lubrication of bearings.	5+2	Understanding and analyzing design and applications of bearings.

Text Books:

1. Mechanical Engineering Design, J. E. Shigley, Mischkee& R. Charles, McGraw Hill, 9th Edition.
2. Design of Machine Elements, V. B. Bhandari, McGraw Hill Education, 4th Edition.

Reference Books:

1. Machine Design, O. P. Grover, CBS Publishers & Distributors, 6th Edition.
2. Design of Machinery - An introduction to the synthesis and analysis of mechanisms and machines, Robert L. Norton, McGraw Hill, 3rd Edition.
3. Design Data Hand Book, PSG College of Technology.
4. Relevant Indian Standards.