

5th SEMESTER MECHANICAL 2026-27
SUBJECT- DESIGN OF MACHINE ELEMENTS
SUBJECT CODE- MEPC303 TH:2 **TOTAL PERIODS-45**
TH.1 -3P/WEEK

Sl No.	week	Day	Topics to be covered
1	1 st	1 st day	Introduction to Design:
		2 nd day	Machine Design philosophy and Procedures; General Considerations in Machine Design
		3 rd day	Fundamentals: Types of loads, concepts of stress, Strain, Stress
Sl No.	week	Day	Topics to be covered
2	2 nd	1 st day	Strain Diagram for Ductile and Brittle Materials
		2 nd day	Principal Stresses, Simple Numericals
		3 rd day	Creep strain and Creep Curve; Fatigue;
Sl No.	week	Day	Topics to be covered
3	3 rd	1 st day	S-N curve; Endurance Limit, Factor of Safety, Stress Concentration
		2 nd day	Properties of Engineering materials
		3 rd day	Designation of materials as per IS and introduction to International standards & advantages of standardization; Use of design data book; Use of standards in design and preferred numbers series
Sl No.	week	Day	Topics to be covered
4	4 th	1 st day	Theories of Elastic Failures; Principal normal stress theory
		2 nd day	Maximum shear stress theory
		3 rd day	Maximum distortion energy theory
Sl No.	week	Day	Topics to be covered
5	5 th	1 st day	Design of simple machine parts: Cotter Joint; Knuckle Joint; Turnbuckle;
		2 nd day	Design of Levers: Hand/Foot Lever & Bell Crank Lever; Design of C-Clamp
		3 rd day	Off-set links; Overhang Crank; Arm of Pulley.
Sl No.	week	Day	Topics to be covered
6	6 th	1 st day	Antifriction Bearings: Classification of Bearings; Sliding contact & Rolling contact
		2 nd day	Terminology of Ball bearings: Life Load relationship, Basic static load rating and Basic dynamic load rating
		3 rd day	limiting speed; Selection of ball bearings using manufacturer's catalogue
Sl No.	week	Day	Topics to be covered
7	7 th	1 st day	Design of Shafts, Keys, Couplings and Spur Gears: Types of Shafts; Shaft materials
		2 nd day	Standard Sizes; Design of Shafts (Hollow and Solid) using strength and rigidity criteria;
		3 rd day	ASME code of design for line shafts supported between bearings with one or two pulleys in between or one overhung pulley

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8	8 th	1 st day	Design of Sunk Keys, Effect of Key-ways on strength of shaft
		2 nd day	Design of Couplings – Muff Coupling
		3 rd day	Protected type Flange Coupling
Sl No.	week	Day	Topics to be covered
9	9 th	1 st day	Bush-pin type flexible coupling
		2 nd day	Spur gear design considerations; Lewis equation for static beam strength of spur gear teeth
		3 rd day	Power transmission capacity of spur gears in bending
Sl No.	week	Day	Topics to be covered
10	10 th	1 st day	Design of Power Screws: Thread Profiles used for power Screws - Relative merits and demerits of each
		2 nd day	Torque required to overcome thread friction
		3 rd day	Self-locking and overhauling property; Efficiency of power screws;
Sl No.	week	Day	Topics to be covered
11	11 th	1 st day	Types of stresses induced
		2 nd day	Design of Screw Jack; Toggle Jack
		3 rd day	Design of springs: Classification and Applications of Springs;
Sl No.	week	Day	Topics to be covered
12	12 th	1 st day	Spring terminology; Materials and Specifications; Stresses in springs; Wahl's correction factor;
		2 nd day	Deflection of springs; Energy stored in springs
		3 rd day	Design of Helical, Tension and Compression springs subjected to uniform applied loads like I.C. engine valves, Weighing balance, Railway buffers and
Sl No.	week	Day	Topics to be covered
13	13 th	1 st day	Governor springs; Leaf springs: Construction and Application.
		2 nd day	Design of Fasteners: Stresses in Screwed fasteners; Bolts of Uniform Strength
		3 rd day	Design of Bolted Joints subjected to eccentric loading

Sl No.	week	Day	Topics to be covered
14	14 th	1 st day	Design of Parallel and Transverse fillet welds; Axially loaded symmetrical section
		2 nd day	Merits and demerits of screwed and welded joints
		3 rd day	Ergonomics & Aesthetic consideration in design: Ergonomics of Design: Man–Machine relationship
Sl No.	week	Day	Topics to be covered
15	15 th	1 st day	Design of Equipment for control, environment & safety
		2 nd day	Aesthetic considerations regarding shape, size, color & surface finish
		3 rd day	Revision

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