

 MAIT उद्यमेन हि सिध्यन्ति कार्याणि न मनोरथैः	Maharaja Agrasen Institute of Technology Department of Mechanical Engineering
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LESSON PLAN

SUBJECT	Machine Design-I
SUBJECT CODE	MEC-212
FACULTY NAME	Dr. Sumit Joshi
SEMESTER	4 th
SECTION	ME
LECTURES PLANNED	42
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S. No.		TOPICS TO BE COVERED	No. of Lectures Planned	No. of Lectures Taken	Deviation if any
1	UNIT-1 (CO.MEC212.1)	Introduction: Review of failure of materials, Stress -strain diagram, FOS, Principal stress, Maximum shear stress.	1		
2		Design of Cotter Joint – spigot & socket type.	1		
3		Design of Knuckle joint.	1		
4		Design of Pipes and pipe joint.	1		
5		SDP - Systematic Design Process, Principles of Mechanical Design, Aesthetic and Ergonomic considerations in design, Use of Standards.	1		
6		Stress Concentration- Causes and Remedies in design.	2		
7		Manufacturing considerations in design - Casting and Machining Parts	1		
8		Dynamic and fluctuating stresses, fatigue failure and endurance limit, Combined Direct and Varying stresses.	3		
9		Tolerances and Fits as per B.I.S.	1		
10		Material Selection, Designation of Steels, Factor of safety & its affecting factors.	1		
11	UNIT-2 (CO.MEC212.2)	Design of Shafts and Keys.	2		
12		Design of Couplings - Muff coupling, clamp coupling.	2		
13		Design of Rigid and Pin Bushed Flexible Couplings.	3		
14		Design of Levers. (Bell Crank Lever)	2		
15		Springs: Uses and design of Close Coiled Helical Springs, Shot Peening of springs.	3		

16	UNIT-3 (CO.MEC212.3)	Introduction to screw fastening and bolts, Initial tightening loads in bolts.	1		
17		Riveted Joints: Types, Failure modes, strength equations, joint efficiency	2		
18		Design of Bolted and Riveted joints under direct and eccentric loads.	2		
19		Welded joints: Strength of welded joints, Eccentrically loaded joints, Welded joints subjected to bending and torsion.	3		
20	UNIT-4 (CO.MEC212.4)	Gears: Classification, Spur gear design with hub, arms and rim, Lewis equation, Dynamic and Wear loads, Gear Failures.	4		
21		Translation screws: Types of threads, efficiency and lead angle. Force analysis and design of various types of power screws.	2		
22		Design of Screw Jack with eccentric loads	3		

Text Books:

1. V.B. Bhandari, “Design of Machine elements”, Tata McGraw Hill Education Private Ltd. Third Edition (2012).
2. Maleeve Hartman and O.P. Grover, “Machine Design”, CBS Publishers & Distributors, Sixth Edition (2015).

Reference Books:

1. Mahadevan, “Design Data Book”, CBS Publishers & Distributors.
2. J.E.Shigley& C.R. Mischke, "Mechanical Engineering Design", Tata McGraw Hill Co. Inc.
3. P.C. Sharma and D.K Aggarwal., “Machine Design”, S.K. Kataria & Sons.
4. Juvinal R C, Marshek K M, “Fundamentals of Machine component Design”, Wiley India.
5. Norton R. I. “Machine Design” Pearson. E. Balaguruswamy, “Programming with Java”, TMH