

CODE: AE303 Title: Design of Machine elements										
L	T	P	Credit	Area		CWS	PRS	MTE	ETE	PRE
3	0	2	4	DCC		15	25	20	40	-

Objectives: Student should be aware about the principle of design, aesthetics consideration in design. He should be able to understand the principle of welded joint, shaft and coupling drives and brakes

Syllabus		Contact Hours
Unit-1	Introduction: Principles of mechanical design, systematic design process, aesthetic and ergonomic considerations in design, use of standards in design. Manufacturing consideration in design, casting, machining, forging. Dynamic and fluctuating stresses, fatigue failure and endurance limit, stress concentration, causes and remedies in design, Factor of safety, Tolerances and types of fits. Selection of materials.	8
Unit-2	Design of Elements: Cotter and knuckle joints; screwed fastenings, bolted and riveted joints under direct and eccentric loads.	6
Unit-3	Welded Joints: Welded joints, strength of welded joints, eccentrically loaded joints, welded joints subjected to bending moment and torsion	7
Unit-4	Shafts and Couplings: Shafts, keys and couplings –design of rigid and pin bushed flexible couplings Translation screws: Force analysis and design of various types of power screws. Springs, uses and design of close coiled helical springs.	7
Unit-5	Mechanical Drives: Selection of transmission, helical, bevel and worm gears, belt and chain drives.	8
Unit-6	Friction Clutches & Brakes: Common friction materials, shoe, band, cone and disc brakes, their characteristics and design, friction clutches	6
	Total	42

Reference Books:

1	Maleeve Hartman and O.P.Grover,"Machine Design",Publisher- CBS Publication & Publishers(ISBN- 8123906374)
2	V.B. Bhandari,"Machine Design", Publisher - Tata McGraw Hill(ISBN- 9780070681798
3	P.C. Sharma and D.K Aggarwal,,"Machine Design", Publisher-S.K. Kataria & Sons(ISBN-9350142813)
4	Mahadevan,"Design Data Book",Publisher-CBS Publishers & Distributors(ISBN- 8123901623)
5	I.E. shigley & C.R. Mischke,"Mechanical Engineering Design",Publisher-Tata McGraw Hill Co.Inc.(ISBN- 9780072832099)

Course Outcomes

CO1	To understand the basics of mechanicals design ,use of standards , material selection,,design considerations in manufacturing, stress concentration.
CO2	To understand different joints under different loading
CO3	To study and analyze welded joints
CO4	To understand and apply the concept of keys , shaft and coupling. And springs in practice.
CO5	To study and apply the concept of mechanical drives.
CO6	To understand the Friction Clutches & Brakes: designs i

CO-PO/PSOMatrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	0	0	0	0	0	0	2	2	1	1
CO2	3	3	2	3	1	0	0	0	0	0	0	1	2	1	1
CO3	3	3	3	3	1	0	0	0	0	0	0	2	3	3	2
CO4	3	3	3	3	1	0	0	0	0	0	0	1	3	3	2
CO5	2	2	2	2	2	0	0	0	0	0	0	1	2	2	2