

"PVC" NSSK GOVT POLYTECHNIC BILASPUR

PLANNED THEORY SYLLABUS COVERAGE

Department: Mech. Engg.		Subject: DESIGN OF MACHINE ELEMENTS				
Sem. & Branch: 6th / Mech. Engg.			Duration: 3 Year			
Teacher Sumit Sharma						
Syllabus coverage		Total periods:-70				
SR. NO	Period no	Topic/Unit	Details	Instruction Reference	Additional study	Remarks
1	1-12	Introduction to Design	Machine Design philosophy; General Design Procedure; General Considerations in Machine Design; Characteristics of a good designer; Fundamentals: Types of loads, concepts of stress, Strain, Types of Stresses; Crushing; Bending and Torsion; Creep strain and Creep Curve; Fatigue; S-N curve; Endurance Limit; Factor of Safety; Stress Concentration; Properties of Engineering materials; standardization and advantages of standardization; Use of design data book; Use of standards in design; Selection of Material; Criterion of material selection.	1. Machine design-R.K. Jain, Khanna Publication, New Delhi. 2. Design Data Book-PSG Coimbtore, PSG Coimbtore.	1. Machine Design-Sadhu Singh, Khanna Publishing Co., Delhi 2. Introduction to Machine Design-V.B.Bhandari, Tata Mc	
2	13-21	Design of Cotter and Knuckle joint	Cotter Joint: Different parts of the Spigot and socket joint; Design of Cotter joint; Design of Socket, Design of spigot, Design of cotter, design of rod. Knuckle Joint: Different parts of the joint, material used for the joint, Design of knuckle joint; Design of rod, Design of pin, Design of single eye, design of double eye.			
3	22-26	Anti friction bearings	Classification of Bearings; Sliding contact & Rolling contact; Terminology of Ball bearings: Life Load relationship, Basic static load rating and Basic dynamic load rating, limiting speed (concept only).			
4	27-36	Design of Shaft	Types of Shafts; Shaft materials; Type of loading on shaft, Standard Sizes; Design of Shafts (Hollow and Solid) subjected to torsion only, using strength and rigidity criteria; Determination of shaft diameter (Hollow and solid) subjected to bending; Determination of shaft diameter (hollow and solid) subjected to combined torsion and bending.			
5	37-40	Design of keys and Spur gear	Types of key, Function of key, Forces acting on sunk keys, Failure of sunk key (by shearing and Crushing), Design of Sunk Keys; Effect of Keyways on strength of shaft. Spur Gear Nomenclature, Design Considerations.(No derivation and Problem on Spur gear)			
6	41-48	Design of Couplings	Necessity of a coupling, advantages of a coupling, Types of coupling, Design of Protected and Unprotected type Flange Coupling			
7	49-58	Design of Riveted and Welded joints	Types of riveted joints, Possible failure of riveted joints, Design of single riveted and double riveted lap and butt joint (zigzag and chain riveting), strength and efficiency of riveted joints. Common types of welded joints, Simple design for V butt welded joints, design for transverse fillet, parallel fillet, combination fillet welded joint			
8	59-66	Design of Threaded joints	Threaded Joints: Common type of screw fastenings; Through Bolts, Tap Bolt, Cap Screw, Stud, set screws. Terminology of screw threads, Designation of screw threads, Types of failure of nut and bolt; Design of bolts or studs for cylinder cover subjected to external tensile force only.			

9	67-70	Ergonomics & Aesthetic consideration in design	Ergonomics of Design: Ergonomics, Man- Machine relationship; Design criteria of Equipment for displays and control; Need of modern approach in Design, Aesthetic considerations regarding shape, size, color& surface finish			
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27/01/2025	