

"PVC" NSSK G.P. BILASPUR at KALOL		Department :- Mechanical Engg. (5 th sem)		Subject- Machine Design		
SYLLABSE COVERRAGE		Course- Diploma		Duration - 3 Years		
		Total Periods - 70		Theory- 70		
Sr no.	Period No's	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	1-7	Introduction	Design – Definition, Type of design, necessity of design 1.1.1 Comparison of designed and un-designed work 1.1.2 Design procedure 1.1.3 Characteristics of a good designer 1.2 Design terminology: stress, strain, factor of safety, factors affecting factor of safety, stress concentration, methods to reduce stress concentration, fatigue, endurance limit. 1.2.1 General design consideration 1.2.2. Codes and Standards (BIS standards) 1.3 Engineering materials and their mechanical properties 1.3.1 Properties of engineering materials: elasticity, plasticity, malleability, ductility, toughness, hardness and resilience. Fatigue, creep, tenacity, strength 1.3.2 Selection of materials, criterion for material selection	Machine Design by R.S. Khurmi and JK Gupta	Machine Design by V.B. Bhandari	
2	8-14	Design Failure	2.1 Various design failure theories- maximum stress theory, maximum strain theory 2.2 Classification of loads 2.3 Design under tensile, compressive and torsional loads	-----do-----	-----do-----	
3	15-24	Design of Shafts	3.1 Type of shafts, shaft materials, Type of loading on shafts, standard sizes of shafts available 3.2 Shafts subjected to torsion only, determination of shaft diameter (hollow and solid shaft) on the basis of - Strength criterion - Rigidity criterion 3.3 Determination of shaft diameter (hollow and solid shaft) subjected to bending 3.4 Determination of shaft diameter (hollow and solid shaft) subjected to combined torsion and bending	-----do-----	-----do-----	

4	25-29	Design of Keys	<p>4.1 Types of keys, materials of keys, functions of keys</p> <p>4.2 Failure of keys (by Shearing and Crushing)</p> <p>4.3 Design of keys (Determination of key dimension)</p> <p>4.4 Effect of keyways on shaft strength</p>	-----do-----	-----do-----
5	30-51	Design of Joints	<p>Types of joints - Temporary and permanent joints, utility of various joints</p> <p>5.1 Temporary Joint</p> <p>5.1.1 Knuckle Joints – Different parts of the joint, material used for the joint, type of knuckle Joint, design of the knuckle joint</p> <p>5.1.2 Cotter Joint – Different parts of the spigot and socket joints, Design of spigot and socket joint</p> <p>5.2 Permanent Joint</p> <p>5.2.1 Welded Joint - Welding symbols. Type of welded joint, strength of parallel and transverse fillet welds</p> <p>5.2.2 Strength of combined parallel and transverse weld</p> <p>5.2.3 Riveted Joints: Rivet materials, Rivet heads, leak proofing of riveted joint – caulking and fullering</p> <p>5.2.4 Different modes of rivet joint failure</p> <p>5.2.5 Design of riveted joint – Lap and butt, single and multi-riveted joint</p>	-----do-----	-----do-----
6	52-58	Design of Flange Coupling	<p>Necessity of a coupling, advantages of a coupling, types of couplings, design of muff coupling, design of flange coupling (both protected type and unprotected type).</p>	-----do-----	-----do-----
7	59-70	Design of Screwed Joints	<p>7.1 Introduction, Advantages and Disadvantages of screw joints, location of screw joints</p> <p>7.2 Important terms used in screw threads, designation of screw threads</p> <p>7.3 Initial stresses due to screw up forces, stresses due to combined forces</p> <p>7.4 Design of bolts for cylinder cover</p>	-----do-----	-----do-----

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