

LESSON PLAN

Name of faculty : **MR. PAWAN KUMAR BALODA**

Discipline : **Mechanical Engineering**

Semester : **5th Semester**

Subject : **Machine Design**

Lesson Plan Duration : **15 weeks**

Work load (Lecture/ Practical) per week (in hours): **4 Hours Lecture**

WEEK	THEORY	
	Day Lecture	Topic(Including Assignment/Test)
1	1	INTRODUCTION- Design – Definition, Type of design, necessity of design
	2	Comparison of designed and undersigned work
	3	Design procedure
	4	Characteristics of a good designer
2	5	Design terminology: stress, strain, factor of safety,
	6	factors affecting factor of safety
	7	Stress concentration, methods to reduce stress concentration, fatigue, endurance limit.
	8	General design consideration
3	9	Codes and Standards (BIS standards)
	10	Engineering materials and their mechanical properties
	11	Properties of engineering materials: elasticity, plasticity,
	12	malleability, ductility
4	13	Toughness, hardness and resilience.
	14	Fatigue, creep, tenacity and strength etc.
	15	Selection of materials, criteria of material selection ,
	16	DESIGN FAILURE - Various design failures-maximum stress theory, maximum strain theory
5	17	Classification of loads Design under tensile, compressive and torsional loads.
	18	DESIGN OF SHAFT -Type of shaft, shaft materials, Type of loading on shaft, standard sizes of shaft available
	19	Shaft subjected to torsion only, Rigidity criterion
	20	determination of shaft diameter (hollow and solid shaft) on the basis of :Strength criterion, Rigidity criterion
6	21	Determination of shaft diameter (hollow and solid shaft) subjected to combined torsion and bending ASSIGNMENT - 1
	22	1ST SESSIONAL TEST
	23	DESIGN OF KEY -Types of key, materials of key, functions of key
	24	Failure of key (by Shearing and Crushing).

7	25	Design of key - (Determination of key dimension)
	26	Effect of keyway on shaft strength. (Figures and problems).
	27	DESIGN OF JOINTS - Types of joints - Temporary and permanent joints, utility of various joints
	28	Temporary Joint: Knuckle Joints – Different parts of the joint,
8	29	Material used for the joint, type of knuckle Joint, design of the knuckle joint. (Figures and problems).
	30	Cotter Joint – Different parts of the spigot and socket joints,
	31	Design of spigot and socket joint.
	32	Welded Joint - Welding symbols
9	33	Type of welded joint, strength of parallel and transverse fillet welds.
	34	Strength of combined parallel and transverse weld.
	35	Riveted Joints. : Rivet materials, Rivet heads,
	36	leak proofing of riveted joint – caulking and fullering.
10	37	Different modes of rivet joint failure.
	38	Design of riveted joint – Lap and butt,
	39	Single and multi riveted joint. ASSIGNMENT- 2
	40	2ND SESSIONAL TEST
11	41	DESIGN OF FLANGE COUPLING - Necessity of a coupling, advantages of a coupling
	42	Types of couplings
	43	Design of muff coupling
	44	Design of flange coupling. (Protected type)
12	45	Design of flange coupling. (Unprotected type)
	46	Numerical
	47	Numerical
	48	DESIGN OF SCREWED JOINTS -Introduction
13	49	Advantages and Disadvantages of screw joints, location of screw joints.
	50	Important terms used in screw threads,
	51	designation of screw threads
	52	Initial stresses due to screw up forces,
14	53	Stresses due to combined forces Design of power screws (Press, screw jack, screw clamp)
	54	Numerical
	55	Numerical ASSIGNMENT - 3
	56	3RD SESSIONAL TEST
15	57	Revision
	58	Revision
	59	Revision
	60	Revision