

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	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	Assignment 1
5	17	1 st Online Test
	18	Design Failure , Various design failures-maximum stress theory, maximum strain theory
	19	Classification of loads
	20	Design under tensile, compressive and torsional loads.
6	21	Type of shaft, shaft materials, Type of loading on shaft,
	22	standard sizes of shaft available
	23	Shaft subjected to torsion only, - Rigidity criterion
	24	determination of shaft diameter (hollow and solid shaft) on the basis of :Strength criterion, Rigidity criterion
7	25	Determination of shaft diameter (hollow and solid shaft) subjected to combined torsion and bending .

	26	Design of Key Types of key, materials of key, functions of key
	27	Failure of key (by Shearing and Crushing).
	28	1st Sessional test
8	29	Design of key (Determination of key dimension)
	30	Effect of keyway on shaft strength. (Figures and problems).
	31	Design of Joints Types of joints - Temporary and permanent joints, utility of various joints
	32	Temporary Joint: Knuckle Joints – Different parts of the joint,
9	33	material used for the joint, type of knuckle Joint, design of the knuckle joint. (Figures and problems).
	34	Cotter Joint – Different parts of the spigot and socket joints,
	35	Design of spigot and socket joint.
	36	2nd Online test
10	37	Welded Joint - Welding symbols. Type of welded joint, strength of parallel and transverse fillet welds.
	38	Strength of combined parallel and transverse weld.
	39	Riveted Joints. : Rivet materials, Rivet heads,
	40	leak proofing of riveted joint – caulking and fullering.
11	41	Different modes of rivet joint failure.
	42	Design of riveted joint – Lap and butt,
	43	Design of Flange Coupling
	44	single and multi riveted joint.
12	45	Numerical
	46	2nd Sessional test
	47	Necessity of a coupling, advantages of a coupling, types of couplings,
	48	design of muff coupling,
13	49	design of flange coupling. (both protected type and unprotected type).
	50	3rd Online test
	51	Design of Screwed Joints ,Introduction,
	52	Advantages and Disadvantages of screw joints, location of screw joints.
14	53	Important terms used in screw threads, designation of screw threads
	54	Initial stresses due to screw up forces, stresses due to combined forces
	55	Design of power screws (Press, screw jack, screw clamp)
	56	Use of design data book during the examination is allowed.
15	57	The paper setter should normally provide all the relevant data for the machine design in the question paper.
	58	Revision
	59	Revision
	60	3rd Sessional test