

LESSON PLAN

Name of faculty : Vikash and Dr.Parveen Kumar Saini

Discipline : Mechanical Engineering

Semester : 5th Semester

Subject : Machine Design

Lesson Plan Duration : 15 weeks (15 september 2022 to 16 January 2023)

Work load (Lecture/ Practical) per week (in hours) 4 Hrs Lect./ Week

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	1	Design terminology: stress, strain, factor of safety,
	2	factors affecting factor of safety
	3	stress concentration, methods to reduce stress concentration, fatigue, endurance limit.
	4	General design consideration
3	1	Codes and Standards (BIS standards)
	2	Engineering materials and their mechanical properties
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4	1	Fatigue, creep, tenacity and strength etc
	2	Selection of materials
	3	criteria of material selection
	4	Assignment 1
5	1	Revision
	2	Design Failure , Various design failures-maximum stress theory, maximum strain theory
	3	Classification of loads, Design under tensile, compressive and torsional loads.
	4	Simple Numericals
6	1	Type of shaft, shaft materials, Type of loading on shaft, standard sizes of shaft available
	2	Numericals
	3	Shaft subjected to torsion only, - Rigidity criterion
	4	determination of shaft diameter (hollow and solid shaft) on the basis of Strength criterion, Rigidity criterion
7	1	Determination of shaft diameter (hollow and solid shaft) subjected to combined torsion and bending . Numericals
	2	Design of Key Types of key, materials of key, functions of key
	3	Failure of key (by Shearing and Crushing).
	4	1st Sessional test
8	1	Design of key (Determination of key dimension) Effect of keyway on shaft strength
	2	Numericals
	3	Design of Joints Types of joints - Temporary and permanent joints, utility of various joints Temporary Joint: Knuckle Joints – Different parts of the joint,
	4	type of knuckle Joint, design of the knuckle joint
9	1	Numericals on Knuckle joint

	2	Cotter Joint – Different parts of the spigot and socket joints,
	3	Design of spigot and socket joint.
	4	Numericals
10	1	Welded Joint - Welding symbols. Type of welded joint, strength of parallel and transverse fillet welds.
	2	Strength of combined parallel and transverse weld., Numericals
	3	Riveted Joints. : Rivet materials, Rivet heads, leak proofing of riveted joint – caulking and fullering
	4	Numericals
11	1	Different modes of rivet joint failure.
	2	Design of riveted joint – Lap and butt,
	3	Design of Flange Coupling
	4	single and multi riveted joint.
12	1	Numerical
	2	2nd Sessional test
	3	Necessity of a coupling, advantages of a coupling, types of couplings,
	4	design of muff coupling,
13	1	design of flange coupling. (both protected type and unprotected type).
	2	Numericals
	3	Design of Screwed Joints ,Introduction,
	4	Advantages and Disadvantages of screw joints, location of screw joints.
14	1	Important terms used in screw threads, designation of screw threads
	2	Initial stresses due to screw up forces, stresses due to combined forces
	3	Numericals
	4	Numericals
15	1	Design of power screws (screw jack)
	2	Design of power screws (Press, screw clamp)
	3	Numericals
	4	3rd Sessional test