UMA CHARAN PATNAIK ENGINEERING SCHOOL, BERHAMPUR

LESSON PLAN

SESSION-2024-25

SUBJECT: DESIGN OF MACHINE ELEMENTS (THEORY- 02)

DEPARTMENT OF MECHANICAL ENGINEERING

Discipline: Mechanical Engineering	Semester: 5th	Name of the Teaching Faculty: DEBASHISH BISI
Subject (Th-2): DESIGN OF MACHINE ELEMENTS	No of Days/Week Class Allotted: 04	No of Week: 15
WEEK	**CLASS DAY**	**THEORY TOPICS**
1	1ST	**CH.1** Introduction to Machine Design, course outcomes.
	2nd	Classification of machine design, Stresses related to machine design, Stress concentration
	3rd	Engineering materials used in design, properties of material.
	4th	Stress-strain curve for ductile and brittle material (Mild steel& Cast iron)
2	1st	Working stress, yield stress, ultimate stress. Factor of safety for Ductile and brittle material.
	2nd	Modes of failure(elastic deflection, yielding & fracture)
	3rd	Factors governing the design of machine elements
	4th	General procedure in machine design
3	1ST	**CH.2.** Fastening elements and types of fastening
	2nd	Welding and types of welded joints.
	3rd	Advantages and disadvantages of welded joints over other joints
	4th	Strength of transverse and parallel fillet welded joint
4	1st	Simple numerical on welding joint
	2nd	Design of welded joints for eccentric loads
	3rd	Different cases of eccentric load and derivations
	4th	Numericals on eccentric loaded welding joint.
5	1st	Riveted joint, types of riveted joint.
	2nd	Failures of riveted joint.
	3rd	Determination of strength and efficiency of riveted joint.
	4th	Design of riveted joint for pressure vessel(boiler)
6	1st	Numericals on design of riveted joints.
	2nd	Numericals on design of riveted joints.
	3rd	Class test.
	4TH	**CH.3.** Introduction to shaft, functions, materials of shaft
7	1st	Design of shaft on basis of strength
	2nd	Design of shaft on basis of strength
	3rd	Design of shaft on basis of rigidity
	4th	Design of shaft on basis of rigidity
8	1st	Numericals on design of shafts
	2nd	Numericals on design of shafts
	3rd	Function of keys, types of keys
	4th	Material of keys, Failures of key, causes, effect of keyway
9	1st	Design rectangular sunk key and solving numericals
	2nd	Design rectangular sunk key and solving numericals
	3rd	Numericals on empirical relation of rectangular sunk key
	4th	Specifications of parallel, gib head, taper key
	1st	Class work on key and shaft

10	2nd	**CH.4.** Introduction to coupling, design of shaft coupling
	3rd	Requirements of a good shaft coupling. Types of coupling.
	4th	Design of sleeve coupling
11	1st	Design of clamp or compression coupling
	2nd	Numerical on design of coupling.
	3rd	Numerical on design of coupling.
	4th	**CH.5.** Introduction to spring and types (open and closed)
12	1st	Materials used and application of spring
	2nd	SWG, specifications of spring.
	3rd	Spring terms for compression type
	4th	Different stresses in helical spring(circular)
13	1st	Different stresses in helical spring(circular)
	2nd	Deflection of helical spring of circular wire
	3rd	Numerical on deflection of helical spring
	4th	Surge in spring and how to avoid it
14	1st	Design of closed coil helical compression spring
	2nd	Design of closed coil helical compression spring
	3rd	Numerical on design of spring
	4th	Numerical on design of spring
15	1st	Doubt clearing of all topics of subject
	2nd	Model question paper practice
	3rd	Model question paper practice
	4th	Closing of subject, course outcomes

TOTAL PERIODS: 60
NO. OF WEEKS: 15