UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

SUBJECT- DESIGN OF MACHINE ELEMENTS **COURSE CODE - TH-2**

NAME OF THE FACULTY - SOUMYA RANJAN MISHRA **SEMESTER- 5TH**

ACADEMIC SESSION- 2025-26

UNIT	WEEK	NO. OF LECTURES	TOPICS TO BE COVERED
1	1st	1	Introduction to machine design
		1	Classification of machine design
		1	Different engineering materials, their mechanical and physical properties.
		1	Mechanical and physical properties of engineering materials
	2nd	1	Stress –strain curve for M.S & C.I.
		1	Working stress, yield stress, ultimate stress
		1	Factor of safety, Numericals on FOS
		1	Modes of Failure
	3rd	1	Failure by deflection
		1	Failure by general yielding & fracture
		1	Factors governing the design of machine elements
		1	General procedures for machine design
2	4th	1	Joints and their classification.
		1	Introduction to Welding
		1	Types of welded joint
		1	Advantages of welded joints over other joints
	5th	1	Design of welded joints for eccentric loads
		1	strength, special cases
		1	stresses for welded joints
		1	Design of welded joints for eccentric loads
	6th	1	Numericals on welded joints
		1	types of riveted joints and types of rivets
		1	modes of failure of riveted joints
		1	Design riveted joints for pressure vessel
	7th	1	Numericals on riveted joints
		1	**CLASS TEST 1 (UNIT 1 & 2)**
3		1	Function of shaft
		1	Materials for shafts
	8th	1	Design of solid & hollow shafts to transmit a given power at given rpm
		1	Based on Strength: Shear stress,Combined bending tension
		1	Based on Rigidity:Angle of twist, Deflection, Modulus of rigidity
		1	standard size of shafts as per I.S, Solve numericals on design of shaft
	9th	1	Numericals on design of shaft
		1	Function of keys, types of keys & material of keys
		1	Failure of key
		1	Design of rectangular sunk key considering its failure against shear & crushing.
	10th	1	Design of rectangular sunk key by using empirical relation for given
		1	Web Based Rapid Prototyping Systems
		1	Numericals on key
		1	specification of parallel key, gib-head key, taper key
	11th	1	effect of keyways
		1	Numericals on key
		1	Design of Shaft Coupling
		1	Requirements of a good shaft coupling
	12th	1	Types of Coupling

4		1	Design of Sleeve or Muff-Coupling
		1	Numericals on Muff-Coupling
		1	Design of Clamp or Compression Coupling
	13th	1	Design of Clamp or Compression Coupling.
		1	Numericals on Clamp or Compression Coupling
5		1	Types of Springs, Materials used for helical spring
		1	Standard size spring wire (SWG).Terms used in compression spring
	14th	1	End Connections for Compression Helical Springs & tension helical spring.
		1	Stress in helical spring of a circular wire.
		1	Load-stress equation,Deflection of helical spring of circular wire
		1	Load-deflection equation
	15th	1	Numericals on design of spring
		1	Surge in spring
		1	Numericals on design of spring
		1	**CLASS TEST 2 (UNIT 3,4 & 5)**

SIGNATURE OF THE FACULTY 11.07.2015

Er. S. R. Mishra
Lecturer (Mechanical)
UGIE, Rourkela