Orissa School of Mining Engineering Keonjhar

Department of Mechanical Engineering

Lesson Plan w.e.f 01.10.2021- 18.01.2022

Subject: **Design of Machine elements (TH2)**			
Discipline: **Mechanical Engineering**		Name of the Faculty: *Dr .Niharika Mohanta*	
Course Code:	**TH-2**	Semester:	**5TH**
Total Periods:	**60**	Examination:	**2021(Winter)**
Theory Periods:	4P/W	Class Test:	20
Maximum Marks:	**100**	End Semester Examination:	80

WEEK	CLASS DAY	THEORY TOPICS
1st	1st	**Module 1:Introduction** Introduction to Machine Design and Classify it.
	2nd	Different mechanical engineering materials used in design with their uses and their mechanical and physical properties
	3rd	Different mechanical engineering materials used in design with their uses and their mechanical and physical properties
	4th	Define working stress, yield stress, ultimate stress & factor of safety
2nd	1st	Stress –strain curve for M.S & C.I.
	2nd	Modes of Failure (By elastic deflection, general yielding & fracture)
	3rd	State the factors governing the design of machine elements.
	4th	Describe design procedure.
3rd	1st	Revision
	2nd	**Module 2:Design of fastening elements:** Introduction
	3rd	Joints and their classification.
	4th	State types of welded joints
4th	1st	State advantages of welded joints over other joints.
	2nd	Design of welded joints(Lap joint and Butt joint)
	3rd	Design of welded joints for eccentric loads
	4th	Solve numerical on Welded Joint
5th	1st	State types of riveted joints and types of rivets.
	2nd	Describe failure of riveted joints.
	3rd	Determine strength & efficiency of riveted joints
	4th	Design riveted joints (Longitudinal joint and circumferential joint)
6th	1st	Design riveted joints for pressure vessel.
	2nd	Solve numerical on Riveted Joints.
	3rd	Solve numerical on Riveted Joints.
	4th	Revision

7th	1st	Revision
	2nd	**Module 3 : Design of shafts and Keys:** State function of shafts.
	3rd	State materials for shafts.
	4th	Design solid & hollow shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress,
8th	1st	Design solid & hollow shafts to transmit a given power at given rpm based on a) Strength: ii)Combined bending tension
	2nd	Numerical
	3rd	Design solid & hollow shafts to transmit a given power at given rpm based on b) Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity
	4th	Numerical
9th	1st	State standard size of shaft as per I.S
	2nd	State function of keys, types of keys & material of key
	3rd	Describe failure of key, effect of key way
	4th	Design rectangular sunk key considering its failure against shear & crushing
10th	1st	Design rectangular sunk key by using empirical relation for given diameter of shaft
	2nd	State specification of parallel key, gib-head key, taper key as per I.S.
		Numerical on keys
	3rd	Revision
	4th	**Module 4 Design of Coupling:** Introduction Design of Shaft Coupling
11th	1st	Requirements of a good shaft coupling
	2nd	Types of Coupling.
	3rd	Design of Sleeve or Muff-Coupling.
	4th	Numerical on Muff-Coupling.
12th	1st	Design of Clamp or Compression Coupling.
	2nd	Numerical on Compression Coupling.
	3rd	Revision
	4th	**Module 5:Design a closed coil helical spring:** Types of spring, Materials used for helical spring
13th	1st	Standard size spring wire. (SWG), Terms used in compression spring
	2nd	Stress in helical spring of a circular wire
	3rd	End connection for helical tension spring
	4th	Deflection of helical spring of circular wire
14th	1st	Eccentric loading of spring
	2nd	Surge in spring, numerical on design of spring.
	3rd	Numerical on spring.
	4th	Revision
15th	1st	Exam oriented unit test
	2nd	Exam oriented unit test
	3rd	Exam problem discussion
	4th	Exam problem discussion