GOVERNMENT POLYTECHNIC JAJPUR
A/ P: Ragadi, Block: Korei, Dist.: Jajpur, Odisha- 755019
Website: https://www.gpjajpur.org E-mail: principalgpjajpur@yahoo.co.in Contact: 9437155107

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (2022-23)

Discipline: Mechanical	**Semester: 5th**	**Name of the Teaching faculty: Manas Kumar Mishra**
Subject: Design of Machine Elements(TH2)	**No of Days/Week class alloted: 4**	**Semester from Date: 15/09/22 To Date: 22/12/22 No of weeks: 16**

Week	Class Day	Topics
1st	1st	**1. INTRODUCTION**
		i) Syllabus, lesson plan
		ii) Course outcomes, exam, class tests pattern
		iii) Introduction to machine design
	2nd	i) introduction to machine design
		ii) Classification of machine design
2nd	1st	i) Different engineering materials, their mechanical and physical properties.
	2nd	i) Mechanical and physical properties of engineering materials, designations of steel
	3rd	i) Stress –strain curve for M.S & C.I.
		ii) Working stress, yield stress, ultimate stress
	4th	iii) Factor of safety, Numericals on FOS.
3rd	1st	i) Modes of Failure
		ii) Failure by deflection
	2nd	i) Failure by general yielding & fracture
	3rd	i) Factors governing the design of machine elements
	4th	i) Factors governing the design of machine elements
4th	1st	i) General procedures for machine design
	2nd	i) General procedures for machine design
		2. DESIGN OF FASTENING ELEMENTS
	3rd	i) Joints and their classification.
	4th	i) Introduction to Welding
		ii) Types of welded joint
5th	1st	i) Advantages of welded joints over other joints
		ii) Design of welded joints for eccentric loads.
		ii) strength, special cases
	2nd	i) stresses for welded joints
		ii) Design of welded joints for eccentric loads.
	3rd	i) Numericals on welded joints.
	4th	i) Numericals on welded joints.
	1st	i) types of riveted joints and types of rivets.

6th	2nd	i)modes of failure of riveted joints.
	3rd	i) Design riveted joints for pressure vessel.
	4th	i) Numericals on riveted joints.
7th	1st	i) Numericals on riveted joints.
	2nd	**CLASS TEST 1 (UNIT 1 & 2)**
		3. DESIGN OF SHAFT AND KEYS
	3rd	i) Function of shaft
		ii) Materials for shafts.
	4th	i) Design of solid & hollow shafts to transmit a given power at given rpm.
		ii) Based on Strength: Shear stress,Combined bending tension
8th	1st	i) Based on Rigidity:Angle of twist, Deflection, Modulus of rigidity
	2nd	i) standard size of shafts as per I.S, Solve numericals on design of shaft
	3rd	i) Numericals on design of shaft
	4th	i) Numericals on design of shaft
9th	1st	i) Function of keys, types of keys & material of keys.
	2nd	i) Failure of key ii) Design of rectangular sunk key considering its failure against shear & crushing
	3rd	i) Design of rectangular sunk key by using empirical relation for given diameter of shaft.
	4th	i) numericals on key
10th	1st	i) numericals on key
	2nd	i) specification of parallel key, gib-head key, taper key
		ii) effect of keyways
		iii) numericals on key
		4. DESIGN OF COUPLING
	3rd	i) Design of Shaft Coupling
	4th	i) Requirements of a good shaft coupling
11th	1st	i) Types of Coupling
	2nd	i) Types of Coupling
	3rd	i) Design of Sleeve or Muff-Coupling
	4th	i) Design of Sleeve or Muff-Coupling
12th	1st	i) Numericals on Muff-Coupling
	2nd	i) Numericals on Muff-Coupling
	3rd	i) Design of Clamp or Compression Coupling.
	4th	i) Design of Clamp or Compression Coupling.
13th	1st	i) Numericals on Clamp or Compression Coupling.
	2nd	i) Numericals on Clamp or Compression Coupling.
		5. DESIGN OF CLOSED COIL HELICAL SPRING
	3rd	i) Types of Springs, Materials used for helical spring.
	4th	i) Standard size spring wire (SWG).

	4th	ii) Terms used in compression spring.
14th	1st	i) Terms used in compression spring.
	2nd	i) End Connections for Compression Helical Springs & tension helical spring.
	3rd	i) Stress in helical spring of a circular wire.
		ii) load-stress equation
	4th	i) Deflection of helical spring of circular wire.
		ii) load-deflection equation
15th	1st	i) numericals on design of spring
	2nd	i) numericals on design of spring
	3rd	i) surge in spring
	4th	i) numericals on design of spring
16th	1st	**CLASS TEST 2 (UNIT 3,4 & 5)**
	2nd	**Previous year question discussion, Probable questions/VST**

LEARNING RESOURCES

SL.NO	AUTHOR	TITLE OF THE BOOK
1	PANDYA AND SHAH	MACHINE DESIGN
2	R.S.KHURMI &J.K.GUPTA	A TEXT BOOK OF MACHINE DESIGN
3	P.C.SHARMA &D.K	A TEXT BOOK OF MACHINE DESIGN
4	V.B.BHANDARI	DESIGN OF MACHINE ELEMENTS
5	S.MD.JALAUDEEN	DESIGN DATA BOOK