GOVERNMENT POLYTECHNIC JAJPUR
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DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (2024-25)

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: 01/07/24 To Date: 08/11/24 No of weeks: 15
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
	3rd	i) Different engineering materials, their mechanical and physical properties.
	4th	i) Mechanical and physical properties of engineering materials, designations of
2nd	1st	i) Stress –strain curve for M.S & C.I.
		ii) Working stress, yield stress, ultimate stress
	2nd	iii) Factor of safety, Numericals on FOS.
	3rd	i) Modes of Failure
		ii) Failure by deflection
	4th	i) Failure by general yielding & fracture
3rd	1st	i) Factors governing the design of machine elements
	2nd	i) Factors governing the design of machine elements
	3rd	i) General procedures for machine design
	4th	i) General procedures, Previous year question discussion
4th	1st	**2. DESIGN OF FASTENING ELEMENTS**
		i) Joints and their classification.
	2nd	i) Introduction to Welding
		ii) Types of welded joint
	3rd	i) Advantages of welded joints over other joints
		ii) Design of welded joints for eccentric loads.
		ii) Strength, special cases
	4th	i) Stresses for welded joints
		ii) Design of welded joints for eccentric loads.

5th	1st	i) Numericals on welded joints.
	2nd	i) Numericals on welded joints.
	3rd	i) Types of riveted joints and types of rivets.
	4th	i)Modes of failure of riveted joints.
6th	1st	i) Design riveted joints for pressure vessel.
	2nd	i) Numericals on riveted joints.
	3rd	i) Numericals on riveted joints.
	4th	i) Numericals on riveted joints, Previous year question discussion
7th	1st	**3. DESIGN OF SHAFT AND KEYS**
		i) Function and applications of shaft
		ii) Materials for shafts.
	2nd	i) Design of solid & hollow shafts to transmit a given power at given rpm.
		ii) Based on Strength: Shear stress,Combined bending tension
	3rd	i) Based on Rigidity:Angle of twist, Deflection, Modulus of rigidity
	4th	i) standard size of shafts as per I.S, Solve numericals on design of shaft
8th	1st	i) Numericals on design of shaft
	2nd	i) Numericals on design of shaft
	3rd	i) Function of keys, types of keys & material of keys.
	4th	i) Failure of key
		ii) Design of rectangular sunk key considering its failure against shear & crushing.
9th	1st	i) Design of rectangular sunk key by using empirical relation for given diameter of shaft.
	2nd	i) Numericals on key
	3rd	i) Numericals on key
	4th	i) Specification of parallel key, gib-head key, taper key
		ii) Effect of keyways
		iii) Numericals on key, Previous year question discussion
10th	1st	**4. DESIGN OF COUPLING**
		i) Design of Shaft Coupling
	2nd	i) Requirements of a good shaft coupling
	3rd	i) Types of Coupling
	4th	i) Parts and their functions. Applications of Coupling
11th	1st	i) Design of Sleeve or Muff-Coupling
	2nd	i) Design of Sleeve or Muff-Coupling
	3rd	i) Numericals on Muff-Coupling
	4th	i) Numericals on Muff-Coupling

12th	1st	i) Design of Clamp or Compression Coupling.
	2nd	i) Design of Clamp or Compression Coupling.
	3rd	i) Numericals on Clamp or Compression Coupling.
	4th	i) Numericals on Clamp or Compression Coupling.
13th	1st	**5. DESIGN OF CLOSED COIL HELICAL SPRING**
		i) Types of Springs, Materials used for helical spring, Applications.
	2nd	i) Standard size spring wire (SWG).
		ii) Terms used in compression spring.
	3rd	i) Terms used in compression spring.
	4th	i) End Connections for Compression Springs & tension helical spring.
14th	1st	i) Stress in helical spring of a circular wire.
		ii) load-stress equation
	2nd	i) Deflection of helical spring of circular wire.
		ii) load-deflection equation
	3rd	i) Numericals on design of spring
	4th	i) Numericals on design of spring
15th	1st	i) Surge in spring
	2nd	i) Numericals on design of spring
	3rd	i) springs in series and parallel
	4th	**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 AGRAWAL	A TEXT BOOK OF MACHINE DESIGN
4	V.B.BHANDARI	DESIGN OF MACHINE ELEMENTS
5	S.MD.JALAUDEEN	DESIGN DATA BOOK

29.06.24

Signature of Teacher

Head, Mech