

GOVERNMENT POLYTECHNIC, MALKANGIRI
DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Discipline: Mechanical Engineering	Semester: 5th	Name of the Teaching Faculty: SHARMILA SABAR
Subject: DESIGN OF MACHINE ELEMENTS	No. of days/week class allotted 4	Semester From date:14.07.2025 To date:15.11.2025 No. of Week: 15
PRE-REQUISITE	STRENGTH OF MATERIALS	
Course Outcomes	<ol style="list-style-type: none"> 1. Understanding the behaviours of material and their uses. 2. Understanding the design of various fastening elements and their industrial uses. 3. Understanding the different failures of design elements. 4. Understanding the change of design to accomplish the different field of applications. 5. Design shafts, keys, couplings required for power transmission. 6. Design closed coil helical spring 	
Week	Class Day	Theory/Practical Topics
1st	1st	Introduction to Machine Design and Classify it.
	2nd	Different mechanical engineering materials used in design with their uses and their mechanical properties.
	3rd	Different mechanical engineering materials used in design with their uses and their mechanical al properties.
	4th	Different mechanical engineering materials used in design with their uses and their physical properties.
2nd	1st	Define working stress, yield stress, ultimate stress & factor of safety and stress-strain curve for M.S
	2nd	Define working stress, yield stress, ultimate stress & factor of safety and stress-strain curve for M.S
	3rd	Define working stress, yield stress, ultimate stress & factor of safety and stress-strain curve for C.I.
	4th	Modes of Failure (By elastic deflection, general yielding & fracture)
3rd	1st	Modes of Failure (By elastic deflection, general yielding & fracture)
	2nd	State the factors governing the design of machine elements
	3rd	State the factors governing the design of machine elements
	4th	Describe design procedure.
4th	1st	Design of fastening elements: Joints and their classification, State types of welded joints .
	2nd	State advantages of welded joints over other joints.
	3rd	Design of welded joints for eccentric loads
	4th	Design of welded joints for eccentric loads
5th	1st	Design of welded joints for eccentric loads
	2nd	State types of riveted joints and types of rivets
	3rd	Describe failure of riveted joints
	4th	Determine strength & efficiency of riveted joints
6th	1st	Determine strength & efficiency of riveted joints
	2nd	Design riveted joints for pressure vessel.
	3rd	Design riveted joints for pressure vessel.
	4th	numerical on Welded Joint and Riveted Joints
7th	1st	Design of shafts and Keys: State function of shafts, State materials for shafts
	2nd	Design solid shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress, (ii) Combined bending tension
	3rd	Design solid shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress, (ii) Combined bending tension
	4th	Design hollow shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress, (ii) Combined bending tension
8th	1st	Design solid shafts to transmit a given power at given rpm based on Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity
	2nd	Design solid shafts to transmit a given power at given rpm based on Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity

	3rd	numerical on Design of Shaft
	4th	State standard size of shaft as per I.S, State function of keys, types of keys & material of keys.
9th	1st	describe failure of key, effect of key way.
	2nd	Design rectangular sunk key considering its failure against shear & crushing.
	3rd	Design rectangular sunk key by using empirical relation for given diameter of shaft.
	4th	State specification of parallel key, gib-head key, taper key as per I.S.
10th	1st	Design of Coupling: Design of Shaft Coupling
	2nd	Design of Coupling: Design of Shaft Coupling
	3rd	Requirements of a good shaft coupling
	4th	Requirements of a good shaft coupling
11th	1st	Types of Coupling.
	2nd	Types of Coupling.
	3rd	Design of Sleeve or Muff-Coupling.
	4th	Design of Sleeve or Muff-Coupling.
12th	1st	Design of Clamp or Compression Coupling.
	2nd	Design of Clamp or Compression Coupling.
	3rd	simple numerical on above.
	4th	simple numerical on above.
13th	1st	Design a closed coil helical spring: Materials used for helical spring. , Standard size spring wire. (SWG
	2nd	Terms used in compression spring.
	3rd	Terms used in compression spring.
	4th	Stress in helical spring of a circular wire.
14th	1st	Stress in helical spring of a circular wire.
	2nd	Deflection of helical spring of circular wire.
	3rd	Deflection of helical spring of circular wire.
	4th	Deflection of helical spring of circular wire.
15th	1st	Surge in spring.
	2nd	Surge in spring.
	3rd	numerical on design of closed coil helical compression spring.
	4th	numerical on design of closed coil helical compression spring.

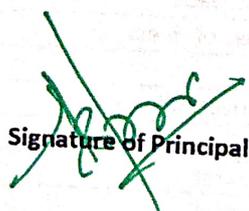
Learning Resources:

1. PANDYA AND SHAH , - MACHINE DESIGN
2. R.S.KHURMI & J.K.GOPTA,- TEXT BOOK OF MACHINE DESIGN
3. V.B.BHANDARI,-DESIGN OF MACHINE ELEMENTS
4. S.MD.JALAUDEEN,- DESIGN DATA BOOK


Signature
of Faculty


Signature of HOB


Signature of Academic
Coordinator


Signature of Principal