Lesson Plan on

(TH-2)DESIGN OF MACHINE ELEMENT

(5th sem)

Prepared by

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Discipline: MECHANICAL ENGG	Semester: ~~3RD~~ 5th	Name of the Teaching Faculty: Mr BISWAJIT NAYAK, PTGF IN MECH. ENGG.
Subject: DESIGN OF MACHINE ELEMENTS (TH.2)	No. of days/per week class allotted: 04	Semester From date: 15.09.2022 To Date: 22.12.2022 No. of Weeks: 15
PRE-REQUISITE	Basic knowledge about design of fastening element,shaft and keys, coupling and closed coil helical spring.	
COURSE OUTCOMES	CO1: . Understanding the behaviours of material and their uses. CO2: Understanding the design of various fastening elements and their industrial uses. CO3: Understanding the different failures of design elements CO4: Understanding the change of design to accomplish the different field of applications. CO5:Design closed coil helical spring and .shafts, keys, couplings required for power transmission	

Week	Class Day	Theory / Practical Topics	DELIVERY METHOD
1ST	1ST	Introduction to Machine Design and Classify it.	Whiteboard
	2ND	Different mechanical engineering materials used in design with their uses and their mechanical and physical properties	Whiteboard
	3RD	Define working stress, yield stress, ultimate stress & factor of safety and stress –strain curve for M.S & C.I	Whiteboard
	4TH	Define working stress, yield stress, ultimate stress & factor of safety and stress –strain curve for M.S & C.I	Whiteboard
2ND	1ST	Modes of Failure (By elastic deflection, general yielding & fracture)	Whiteboard
	2ND	State the factors governing the design of machine elements	Whiteboard
	3RD	Describe design procedure	Whiteboard
	4TH	QUIZ & ASSIGNMENT-I	Whiteboard
3RD	1ST	Design of fastening elements:	Whiteboard
	2ND	Joints and their classification.	Whiteboard
	3RD	State types of welded joints .	Whiteboard
	4TH	State advantages of welded joints over other joints.	PPT
4TH	1ST	Design of welded joints for eccentric loads	
	2ND	numerical	PPT
	3RD	numerical	Whiteboard
	4TH	State types of riveted joints and types of rivets.	Whiteboard
5TH	1ST	Describe failure of riveted joints.	Whiteboard
	2ND	Determine strength & efficiency of riveted joints	Whiteboard
	3RD	Design riveted joints for pressure vessel.	Whiteboard
	4TH	Solve numerical on riveted joint	Whiteboard
6TH	1ST	QUIZ & ASSIGNMENT-II	Whiteboard
	2ND	Design of shafts and Keys:	Whiteboard
	3RD	State function of shafts.	PPT
	4TH	State materials for shafts.	Whiteboard
	1ST	Design solid & hollow shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress, (ii) Combined bending tension; b) Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity	Whiteboard
	2ND	Design solid & hollow shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress, (ii) Combined bending tension; b) Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity	Whiteboard
	3RD	State standard size of shaft as per I.S.	Whiteboard

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7TH	4TH	Solve numerical on design of shaft.	Whiteboard
8TH	1ST	Solve numerical on design of shaft.	Whiteboard
	2ND	State function of keys, types of keys & material of key	PPT
	3RD	Describe failure of key, effect of key way.	Whiteboard
	4TH	Design rectangular sunk key considering its failure against shear & crushing	Whiteboard
9TH	1ST	Design rectangular sunk key by using empirical relation for given diameter of shaft.	Whiteboard
	2ND	State specification of parallel key, gib-head key, taper key as per I.S.	Whiteboard
	3RD	Solve numerical on Design of keys.	Whiteboard
	4TH	**QUIZ & ASSIGNMENT-III**	PPT
10TH	1ST	Design of Shaft Coupling	Whiteboard
	2ND	Requirements of a good shaft coupling	Whiteboard
	3RD	Types of Coupling.	PPT
	4TH	Design of Sleeve or Muff-Coupling	PPT
11TH	1ST	Design of Clamp or Compression Coupling	
	2ND	Solve simple numerical on above.	Whiteboard
	3RD	**QUIZ & ASSIGNMENT-IV**	Whiteboard
	4TH	Design a closed coil helical spring	Whiteboard
12TH	1ST	Materials used for helical spring	PPT
	2ND	Standard size spring wire. (SWG).	Whiteboard
	3RD	Terms used in compression spring	Whiteboard
	4TH	Stress in helical spring of a circular wire	Whiteboard
13TH	1ST	Deflection of helical spring of circular wire.	Whiteboard
	2ND	Surge in spring	Whiteboard
	3RD	Solve numerical on design of closed coil helical compression spring	Whiteboard
	4TH	**QUIZ & ASSIGNMENT-V**	Whiteboard
14TH	1ST	REVISION	Whiteboard
	2ND	REVISION	Whiteboard
	3RD	REVISION	Whiteboard
	4TH	REVISION	Whiteboard
15TH	1ST	REVISION	
	2ND	**REVISION**	
	3RD		
	4TH		

LEARNING RESOURCES:

01. A TEXT BOOK OF MACHINE DESIGN BYR.S.KHURMI &J.K.GOPTA

02.MACHINE DESIGN BY PANDYA AND SHAH

03. DESIGN DATA BOOK BY S.MD.JALAUDEEN

WEBSITE RESOURCES:

https://www.youtube.com/watch?v=hYGEBQphtkw&list=PLiSPNzs4fD9s131_cBl_G4DLkG-GrinLb

https://www.youtube.com/watch?v=nqhyCzrFp1s&list=PLm_MSClsnwm-QwOu8EkbM7C-DOUB4DxLD

Brijendra Nayak

Sign. Of Concerned Faculty

Principal
G.P. Puri

17/09/22

Sign. Of HOD

Types of evaporator, Bare tube coil evaporator, finned

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