KIIT POLYTECHNIC

Department of Mechanical Engineering

LESSON PLAN

Session :: Winter – 2022

Course Type :: Theory

Semester/Branch :: 5th Semester, Mechanical Engineering

Subject (with code) :: **Design of Machine Elements [Th-2]**

Contact hours/week :: 4

Name of Faculty :: **Tushar Kanta Mahapatra**

SL. NO.	CLASS ID	COURSE CONTENT	MODE OF DELIVERY	EXHIBIT/ REFERENCE
Chapter-1: Introduction				
1	1	Introduction about Machine Design and classification, types of load	Lecture	Study material
2	2	Factors governing the design of machine elements. Design procedure	Lecture	Study material / Personal Video Link
3	3	Mechanical properties of the material of the product.	Lecture	Study material
4	4	Types of loads. Working stress, Yield stress, Ultimate stress & Factor of safety. Fatigue & Creep.	Lecture	PPT/ Study material
5	5	Modes of Failure (By elastic deflection, general yielding & fracture)	Lecture	PPT
Chapter-2: Design of fastening elements				
6	6	Method of riveting, Types of riveted joints	Lecture	PPT / Study material
7	7	Failures of riveted joints, Strength & efficiency of riveted joints.	Lecture	PPT/ Study material
8	8	Classroom Problem	Lecture	From Reference Books
9	9	Classroom Problem	Lecture	From Reference Books
10	10	Types of welded joints. Advantages of welded joints over other joints.	Lecture	From Reference Books
11	11	Strength of welded joints for eccentric loads.	Video Content	YouTube Link / NPTL Link
12	12	Classroom Problem	Lecture	From Reference Books
13	13	Classroom Problem	Student Participation	From Reference Books
14	14	Review class	Questionnaire Discussion	
15	15	Class Test/ *Assignment Evaluation*		
16	16	Nomenclatures, form of threads & specifications.	Lecture	PPT / Study material
17	17	Design of screw thread (nut and bolt).	Lecture	Study material
18	18	Classroom Problem		From Reference Books
Chapter-3: Design of shafts and Keys				
19	19	Function of shafts. Materials for shafts. Standard size of shaft as per I.S.	Lecture	Study material
20	20	Design solid & hollow shafts to transmit a given power at given rpm based on (a) Strength (Shear stress, Combined bending & tension)	Lecture	PPT / Study material

21	21	Classroom Problem		From Reference Books
22	22	Design solid & hollow shafts to transmit a given power at given rpm based on (b) Rigidity (Angle of twist, Deflection, modulus of rigidity)	Lecture	PPT
		Classroom Problem	Lecture	From Reference Books
23	23	Classroom Problem	Lecture	From Reference Books
24	24	Function of keys, types of keys & material of keys. Failure of key, effect of key way.	Lecture	Study material / From Reference Book
25	25	Design rectangular sunk key considering its failure against shear & crushing.	Lecture	Study material / From Reference Book
26	26	Specification of parallel key, Gibb-head key, taper key as per I.S.	Lecture	Study material
		Classroom Problem		From Reference Book
27	27	Classroom Problem	Lecture	From Reference Books
28	28	Review class	Questionnaire Discussion	
29	29	Class Test/ *Assignment Evaluation*		
Chapter-4: Design of Coupling				
30	30	Design of Shaft Coupling, Requirements of a good shaft coupling , Types of Coupling	Lecture	PPT/ Study material
31	31	Design of Sleeve or Muff-Coupling.	Lecture	Study material
32	32	Classroom Problem		From Reference Books
33	33	Design of Clamp or Compression Coupling.	Lecture	Study material
34	34	Classroom Problem	Student Participation	From Reference Books
35	35	Review class	Questionnaire Discussion	
36	36	Class Test/ *Assignment Evaluation*		
Chapter-5: Design a closed coil helical spring				
37	37	Materials used for helical spring. Standard size spring wire. (SWG), Terms used in compression spring.	Lecture	Study material / From Reference Book
38	38	Stress in helical spring of a circular wire. End connection for helical tension spring.	Lecture	Study material
39	39	End connection for helical tension spring. Deflection of helical spring of circular wire. Surge inspring	Lecture	Nptel Reference
40	40	Classroom Problem		From Reference Books
41	41	Classroom Problem	Student Participation	From Reference Books
42	42	Review class	Questionnaire Discussion	
43	43	Class Test/ *Assignment Evaluation*		
44	44	Revision		
45	45	Revision		
46	46	*Discussion on Previous year question paper*	Group Discussion	
47	47	*Discussion on Previous year question paper*	Group Discussion	
48	48	*Discussion on Previous year question paper*	Group Discussion	

Signature of Concern Teacher