Department of Mechanical Engineering
Raajdhani Engineering College, Bhubaneswar, Odisha-751017

LESSON PLAN

Faculty Name	**PROF. MANAS RANJAN DAS**			Name of the Program	**Diploma in Mechanical Engineering**
Course Name	**DESIGN OF MACHINE ELEMENT**			Course Code	**TH-2 / (C 302)**
Course Year	**3rd year**	Semester	**5th**	Academic Period	**2023-24**
No. of Classes allotted per Week	**04**	Planned Classes Required to Complete the Course			**60**

Sl. No.	Topics to be covered	Module	No. of hours Required	Mode of Teaching	CO	BOOK	CHAPTER (PAGES)	OTHER SOURCE(IM)
1	Introduction to Machine Design	I	1	LM/ IM	CO1	T1 T2	T1 : 1–15 T2 :-1-19	https://youtu.be/nqhyCzrFp1s
2	Classify Machine Design	I	1	LM/ IM	CO1	T1 T2	T1 : 1–15 T2 :-1-19	https://youtu.be/bRGD_97o2cw https://youtu.be/BPMd9nC_KWo
3	Different mechanical engineering materials used in design with their uses.	I	1	LM/ IM	CO1	T1 T2	T1 : 16–52	https://youtu.be/PaGJwOPg2kU
4	Mechanical and physical properties	I	1	LM/ IM	CO1	T1 T2	T1 : 16–52 T2 :-20-53	https://youtu.be/ohO6vdpOg2k https://youtu.be/4val-DD3GAA
5	Define working stress, yield stress, ultimate stress.	I	1	LM/ IM	CO1	T1	T1 : 87–119	https://youtu.be/HPuipht_HaM

						T2		
6	factor of safety and stress –strain curve for M.S & C.I.	II	1	LM/ IM	CO1	T1 T2	T1 : 87–119 T2 :-20-53	https://youtu.be/hUwUcLxwD0I https://youtu.be/zc3b6LdDFtY
7	Modes of Failure (By elastic deflection, general yielding & fracture)	II	1	LM/ IM	CO1	T1 T2	T1 : 120–180	https://youtu.be/-FG9AVYqF0U https://youtu.be/gDygN25R8Kk
8	State the factors governing the design of machine elements.	II	1	LM/ IM	CO1	T1 T2	T1 : 1–15	https://youtu.be/dcPxG7BjouU
9	Describe design procedure.	II	1	LM/ IM	CO1	T1 T2	T1 : 1–15	https://youtu.be/fZI0LVFFCtQ
10	.Surprise test/Assignment	II	1	LM/ IM	CO1	T1 T2	T1 : 1–180	
11	Quiz test/Assignment	II	1	LM/ IM	CO1	T1 T2	T1 : 1–180	
12	Previous year question paper discussion.	II	1	LM/ IM	CO1	T1 T2	T1 : 1–180	
13	Joints and their classification.	II	1	LM/ IM	CO2	T1 T2	T1 : 341–376 T2 :-272-325	https://youtu.be/LJkSQPITRSY

14	State types of welded joints.	II	1	LM/ IM	CO2	T1 T2	T1 : 341–376	https://youtu.be/8kbUZLuhrW8
15	State advantages of welded joints over other joints.	II	1	LM/ IM	CO2	T1 T2	T1 : 341–376	https://youtu.be/YCgDuOGj6Gg
16	Design of welded joints for eccentric loads.	II	1	LM/ IM	CO2	T1 T2	T1 : 341–376	https://youtu.be/__py5xbKHGA
17	Numericals on Design of welded joints for eccentric loads.	II	1	LM/ IM	CO2	T1 T2	T1 : 341–376	
18	State types of riveted joints and types of rivets.	II	1	LM/ IM	CO2	T1 T2	T1 : 281–340 T2 :- 272-325	https://youtu.be/YQoegtLFL5A?list=PLufxcg39MGOLGFQ0G0wH0OkZNISoU00Au
19	Describe failure of riveted joints.	II	1	LM/ IM	CO2	T1 T2	T1 : 281–340	https://youtu.be/xkcfoTfH6tg https://youtu.be/XpfZrZUDY4I
20	Determine strength & efficiency of riveted joints.	II	1	LM/ IM	CO2	T1 T2	T1 : 281–340	https://youtu.be/XpfZrZUDY4I
21	Numericals on Determine strength & efficiency of riveted joints.	II	1	LM/ IM	CO2	T1 T2	T1 : 281–340	
22	Design riveted joints for pressure vessel.	II	1	LM/ IM	CO2	T1 T2	T1 : 281–340	https://youtu.be/HOa9WrzxN40

Department of Mechanical Engineering
Raajdhani Engineering College, Bhubaneswar, Odisha-751017

23	Numericals on Design riveted joints for pressure vessel.	III	1	LM/ IM	CO2	T1 T2	T1 : 281–340	
24	Surprise test/Quiz test/previous year question paper discussion	III	1	LM/ IM	CO2	T1 T2	T1 : 281–340	
25	State function of shafts. State materials for shafts.	III	1	LM/ IM	CO3	T1 T2	T1 : 509–557 T2 :-330-389	https://youtu.be/riSuEI8buDg?list=PLUlWLBC19q25NIzGyEK_1hYwDlpgamH-H
26	Design solid & hollow shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress, (ii) Combined bending tension;	III	1	LM/ IM	CO3	T1 T2	T1 : 509–557	https://youtu.be/Fp5-jjmaksM
27	Design solid & hollow shafts to transmit a given power at given rpm based on b) Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity	III	1	LM/ IM	CO3	T1 T2	T1 : 509–557	https://youtu.be/Fp5-jjmaksM
28	State standard size of shaft as per I.S.	III	1	LM/ IM	CO3	T1 T2	T1 : 509–557 T2 :-330-389	https://youtu.be/RWLOE3sJIGE
29	Numericals on Design solid & hollow shafts to transmit a given power at given rpm.	III	1	LM/ IM	CO3	T1 T2	T1 : 509–557	
30	State function of keys, types of keys & material of keys.	III	1	LM/ IM	CO4	T1 T2	T1 : 470–508 T2 :-330-389	https://youtu.be/F3c6GPAFZMI

Department of Mechanical Engineering
Raajdhani Engineering College, Bhubaneswar, Odisha-751017

31	Describe failure of key, effect of key way.	III	1	LM/ IM	CO4	T1 T2	T1 : 470–508	https://youtu.be/5FPBHirDEO0
32	Design rectangular sunk key considering its failure against shear & crushing.	IV	1	LM/ IM	CO4	T1 T2	T1 : 470–508	https://youtu.be/NjnNl2BZu9I
33	Design rectangular sunk key by using empirical relation for given diameter of shaft.	IV	1	LM/ IM	CO4	T1 T2	T1 : 470–508	https://youtu.be/NjnNl2BZu9I
34	State specification of parallel key, gib-head key, taper key as per I.S.	IV	1	LM/ IM	CO4	T1 T2	T1 : 470–508	https://youtu.be/S8Qmy4fGnnE
35	Solve numerical on Design of keys	IV	1	LM/ IM	CO4	T1 T2	T1 : 470–508	
36	Surprise Test/Assignment/ previous year question paper discussion.	IV	1	LM/ IM	CO4	T1 T2	T1 : 470–508	
37	Design of Shaft Coupling	IV	1	LM/ IM	CO5	T1 T2	T1 : 470–508 T2 :-330-389	https://youtu.be/SPnTA3H2G7g
38	Requirements of a good shaft coupling	IV	1	LM/ IM	CO5	T1 T2	T1 : 470–508	https://youtu.be/HBNJmGF5SO0
39	Types of Coupling.	IV	1	LM/ IM	CO5	T1 T2	T1 : 470–508	https://youtu.be/SPnTA3H2G7g

40	Design of Sleeve or Muff-Coupling.	IV	1	LM/ IM	CO5	T1 T2	T1 : 470–508	https://youtu.be/SPnTA3H2G7g
41	Numericals on Design of Sleeve or Muff-Coupling.	IV	1	LM/ IM	CO5	T1 T2	T1 : 470–508	
42	Numericals on Design of Sleeve or Muff-Coupling.	IV	1	LM/ IM	CO5	T1 T2	T1 : 470–508	
43	Design of Clamp or Compression Coupling.	V	1	LM/ IM	CO5	T1 T2	T1 : 470–508	https://youtu.be/SPnTA3H2G7g
44	Numericals on Design of Clamp or Compression Coupling.	V	1	LM/ IM	CO5	T1 T2	T1 : 470–508	
45	Numericals on Design of Clamp or Compression Coupling.	V	1	LM/ IM	CO5	T1 T2	T1 : 470–508	
46	Surprise Test/Assignment.	V	1	LM/ IM	CO5	T1 T2	T1 : 470–508	
47	Quiz Test/Assignment.	V	1	LM/ IM	CO5	T1 T2	T1 : 470–508	

48	previous year question paper discussion.	V	1	LM/ IM	CO5	T1 T2	T1 : 470–508	
49	Materials used for helical spring.	V	1	LM/ IM	CO6	T1 T2	T1 : 820–884 T2 :-393-444	https://youtu.be/kInQuEwhyPw
50	Standard size spring wire. (SWG).	V	1	LM/ IM	CO6	T1 T2	T1 : 820–884	https://youtu.be/kInQuEwhyPw
51	Terms used in compression spring.	V	1	LM/ IM	CO6	T1 T2	T1 : 820–884	https://youtu.be/kInQuEwhyPw
52	Stress in helical spring of a circular wire.	V	1	LM/ IM	CO6	T1 T2	T1 : 820–884	https://youtu.be/kInQuEwhyPw
53	Deflection of helical spring of circular wire.	VI	1	LM/ IM	CO6	T1 T2	T1 : 820–884 T2 :-393-444	https://youtu.be/kInQuEwhyPw
54	Surge in spring.	VI	1	LM/ IM	CO6	T1 T2	T1 : 820–884	https://youtu.be/kInQuEwhyPw
55	Solve numerical on design of closed coil helical compression spring.	VI	1	LM/ IM	CO6	T1 T2	T1 : 820–884	

56	Solve numerical on design of closed coil helical compression spring.	VI	1	LM/ IM	CO6	T1 T2	T1 : 820–884	
57	Solve numerical on design of closed coil helical compression spring.	VI	1	LM/ IM	CO6	T1 T2	T1 : 820–884	
58	Surprise Test/Assignment.	VI	1	LM/ IM	CO6	T1 T2	T1 : 820–884	
59	Quiz Test/Assignment.	VI	1	LM/ IM	CO6	T1 T2	T1 : 820–884	
60	Previous year question paper discussion.	VI	1	LM/ IM	CO6	T1 T2	T1 : 820–884	

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LM: Learner Mode: Chalk & Talk, Lecture **IM: Interactive Mode:** PPT, VIDEO and Animation

T1: A TEXT BOOK OF MACHINE DESIGN, R.S.KHURMI & J.K.GOPTA, S.CHAND
T2: Design of Machine Elements, V.B. Bhandari, Tata McGraw Hill (Selected portion of Chapter)

R1: Machine Design, PANDYA AND SHAH, CHAROTAR PP
R2: A TEXT BOOK OF MACHINE DESIGN, P.C.SHARMA &D.K AGRAWAL, S.K.KATARIY A

Suggested link from NPTEL video/Suggested web reading:
https://archive.nptel.ac.in/courses/112/105/112105125/#watch
Prof. B. Maiti, Prof. G. Chakraborty, Prof. S.K. Roychowdhury (IIT Kharagpur)

Signature of the Faculty **Signature of the HOD**