Atal Bihari Vajpayee Govt Institute of Engineering & Technology

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Academic Year	January 2026- June 2026
Scheme	N-2022
Semester	Sixth
Course Code	MEPC302
Course Name	Design of Machine Elements
Course Type	PROGRAMME CORE COURSE (PC)
L-T-P	3-2-0
Name of Faculty	NIKHIL SHARMA
Semester Start & End Dates	27-01-2026 TO 27-05-2026

STUDY AND EVALUATION SCHEME

Sr. No.	Name of the Subject	Th.	Pr.	Internal Assessment			External Assessment					Total Marks	Credit
				Th.	Pr.	Total	Th.	Hrs.	Pr.	Hrs.	Total		
1	Design of Machine Elements	05	---	40	---	40	60	03	---	---	60	100	03

On the successful completion of this course, students will be able to:-

CO1	Analyze the various modes of failure of machine components under different load patterns.
CO2	Design and prepare part and assembly drawings
CO3	Use design data books and different codes of design.
CO4	Select standard components with their specifications from manufacturer's catalogue
CO5	Develop drawings on CAD software.

Reference Books:

1.Machine Design–Sadhu Singh, Khanna Book Publishing Co.
2. Machine Design Data Book–Sadhu Singh, Revised Edition, Khanna Book

Teaching Plan:

Unit No	No. of Lect. Planned	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
1. Introduction to Design	1	Machine Design philosophy; General Design Procedure, General Considerations in Machine Design; Characteristics of a good designer	27.01.2026		
	2	Fundamentals: Types of loads, concepts of stress, Strain, Types of Stresses; Crushing; Bending and Torsion	28.01.2026		
	3	Creep strain and Creep Curve; Fatigue; S-N curve; Endurance Limit; Factor of Safety; Stress Concentration	29.01.2026		
	4	Properties of Engineering materials; standardization and advantages of standardization	30.01.2026		
	5	Use of design data book; Use of standards in design	31.01.2026		
	6	Selection of Material; Criterion of material selection	3.02.2026		
	7	Do	4.02.2026		
	8	Do	5.02.2026		
	9	do	6.02.2026		
2. Design of Cotter and Knuckle Joint, Antifriction Bearings	10	Cotter Joint: Different parts of the Spigot and socket joint; Design of Cotter joint; Design of Socket, Design of spigot, Design of cotter, design of rod.	7.02.2026		
	11	do	10.02.2026		
	12	do	11.02.2026		
	13	Numerical problems on cotter joint	12.02.2026		
	14	do	13.02.2026		
	15	Knuckle Joint: Different parts of the joint, material used for the joint, Design of knuckle joint; Design of rod, Design of pin, Design of single eye, design of double eye	17.02.2026		
	16	do	18.02.2026		
	17	Numerical problems on knuckle	19.02.2026		

		joint			
	18	do	20.02.2026		
	19	Classification of Bearings; Sliding contact & Rolling contact; Terminology of Ball bearings	21.02.2026		
	20	Life Load relationship, Basic static load rating	24.02.2026		
	21	Basic dynamic load rating, limiting speed	25.02.2026		
	22	Numerical	26.02.2026		
	23	Numerical	27.02.2026		
	24	Numerical	28.02.2026		
	25	Numerical	3.03.2026		
3. Design of shaft, Design of Keys and Spur Gear	26	Types of Shafts; Shaft materials; Type of loading on shaft, Standard Sizes; Design of Shafts (Solid) subjected to torsion only	3.03.2026		
	27	Design of Shafts Hollow shaft subjected to torsion only	6.03.2026		
	28	Determination of solid shaft diameter subjected to bending only	7.03.2026		
	29	Determination of hollow shaft diameter subjected to bending only	12.03.2026		
	30	Determination of solid shaft diameter subjected to combined bending and torsion	13.03.2026		
	31	Determination of hollow shaft diameter subjected to combined bending and torsion	17.03.2026		
	32	Types of key, Function of key, Forces acting on sunk keys,	18.03.2026		
	33	Failure of sunk key (by shearing and Crushing), Design of Sunk Keys	19.03.2026		
	34	Effect of Keyways on strength of shaft. Spur Gear Nomenclature, Design Considerations	20.03.2026		
	35	do	24.03.2026		
	36	Numerical	25.03.2026		
	37	Numerical	27.03.2026		
	38	Numerical	28.03.2026		
	39	Numerical	31.03.2026		
4. Design of Couplings, Design of Riveted and Welded Joints	40	Necessity of a coupling, advantages of a coupling, Types of coupling	01.04.2026		
	41	Design of Protected type Flange Coupling	02.04.2026		
	42	Design of Unprotected type	04.04.2026		

			Flange Coupling			
		43	Types of riveted joints, Possible failure of riveted joints, Design of single riveted lap and butt joint	09.04.2026		
		44	Design of double riveted lap and butt joint (zigzag and strength and efficiency ofriveted joints. Common types of welded joints,	10.04.2026		
		45	Simple design for V butt welded joints, design for transverse fillet , parallel fillet, combination fillet welded joint	16.04.2026		
		46	Numerical	17.04.2026		
		47	DCS	18.04.2026		
		48	Numerical	21.04.2026		
		49	Numerical	22.04.2026		
		50	DCS	23.04.2026		
	5. Design of threaded joints, Ergonomics & Aesthetic consideration in design	51	Threaded Joints: Common type of screw fastenings; Through Bolts, Tap Bolt, Cap Screw, Stud, set screws. Terminology of screw threads	24.04.2026		
		52	Designation of screw threads, Types of failure of nut and bolt	25.04.2026		
		53	Design of bolts or studs for cylinder cover subjected to external tensile force only	28.04.2026		
		54	Ergonomics of Design: Ergonomics, Man– Machine relationship	29.04.2026		
2. an An		55	Design criteria of Equipment for displays and control; Need of modern approach in Design	30.04.2026		
		56	do	12.05.2026		
		57	regarding shape, size, color& surface finish	13.05.2026		
		58	do	14.5.2026		
		59	DCS	15.05.2026		
		60	DCS	16.05.2026		
		61	DCS	19.05.2026		
		62	DCS	20.05.2026		
		63	REVISION	21.05.2026		
		64	REVISION	22.05.2026		
		65	REVISION	23.05.2026		
		66	REVISION	23.05.2026		

Home Assignments

Ass. No	Contents of Syllabus Covered	Proposed date	Actual Date	Remarks
1	Unit-1&2	03.03.2026		
2	Unit-3&4	23.04.2026		
3				

Class /House Test

Name of Test	Syllabus Covered in Tests (Unit/Chapter Wise)	Proposed date	Actual Date	Remarks
Class Test-I	30% of whole syllabus	As per HPTSB Academic Calendar Schedule		
Class Test-II	60% of whole syllabus			
House Test	80% of whole syllabus			

(Nikhil Sharma)

Signature of Course Teacher with Name

Approved by

Signature: _ _ _ _ _ _ _ _ _

OIC/HoD/Principal

Faculty Signature: _ _ _ _ _ _ _ _ _