LESSON PLAN FOR DESIGN OF MACHINE ELEMENTS

Name of Teacher- Rohit Tiwari	Subject-Design of Machine Elements	**Jan-May 2025**		Class- **6th sem, ME**

S.NO.	WEEK	CONTENTS	REMARKS
1	Week 1	Introduction to Design: Machine Design philosophy; General Design Procedure; General Considerations in Machine Design; Characteristics of a good designer; Fundamentals: Types of loads, concepts of stress, Strain, Types of Stresses; Crushing; Bending and Torsion; Creep strain and Creep Curve	
2	Week 2	Fatigue; S-N curve; Endurance Limit; Factor of Safety; Stress Concentration; Properties of Engineering materials; standardization and advantages of standardization; Use of design data book; Use of standards in design; Selection of Material; Criterion of material selection.	
3	Week 3	Design of Cotter and Knuckle Joint: 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.	
4	Week 4	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.	
5	Week 5	Antifriction Bearings (problems and derivations omitted): Classification of Bearings; Sliding contact & Rolling contact; Terminology of Ball bearings: Life Load relationship, Basic static load rating and Basic dynamic load rating, limiting speed	
6	Week 6	Design of shaft: Types of Shafts; Shaft materials; Type of loading on shaft, Standard Sizes; Design of Shafts (Hollow and Solid) subjected to torsion only, using strength and rigidity criteria; Determination of shaft diameter (Hollow and solid) subjected to bending; Determination of shaft diameter (hollow and solid) subjected to combined torsion and bending.	
7	Week 7	Design of Keys and Spur Gear: Types of key, Function of key, Forces acting on sunk keys, Failure of sunk key (by shearing and Crushing), Design of Sunk Keys; Effect of Keyways on strength of shaft. Spur Gear Nomenclature, Design Considerations	
8	Week 8	Design of Couplings: Necessity of a coupling, advantages of a coupling, Types of coupling, Design of Protected and Unprotected type Flange Coupling	
9	Week 9	Design of Riveted and Welded Joints: Types of riveted joints, Possible failure of riveted joints, Design of single riveted and double riveted lap and butt joint (zigzag and chain riveting), strength and efficiency of riveted joints.	
10	Week 10	Common types of welded joints, Simple design for V butt welded joints, design for transverse fillet , parallel fillet, combination fillet welded joint	
11	Week 11	Design of threaded joints: Threaded Joints: Common type of screw fastenings; Through Bolts, Tap Bolt, Cap Screw, Stud, set screws.	
12	Week 12	Terminology of screw threads, Designation of screw threads, Types of failure of nut and bolt; Design of bolts or studs for cylinder cover subjected to external tensile force only.	
13	Week 13	Ergonomics & Aesthetic consideration in design: Ergonomics of Design: Ergonomics, Man–Machine relationship; Design criteria of Equipment for displays and control;	
14	Week 14	Need of modern approach in Design, Aesthetic considerations regarding shape, size, color& surface finish	

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LESSON PLAN FOR DESIGN OF DISASTER MANAGEMENT

Name of Teacher- Rohit Tiwari	Subject-Disaster Management	**Jan-May 2025**		Class- 6**th sem, ME**

S.NO.	WEEK	CONTENTS	REMARKS
1	Week 1	Understanding the Concepts and definitions of Disaster, Hazard, Vulnerability, Risk, Capacity – Disaster and Development, and disaster management.	
2	Week 2	Types, Trends, Causes, Consequences and Control of Disasters Geological Disasters (earthquakes, landslides, tsunami, mining); Hydro-Meteorological Disasters (Floods, cyclones, lightning, thunderstorms, hailstorms, avalanches, droughts, cold and heat waves)	
3	Week 3	Biological Disasters (epidemics, pest attacks, forest fire); Technological Disasters (chemical, industrial, radiological, nuclear) and Manmade Disasters (building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters)	
4	Week 4	Global Disaster Trends – Emerging Risks of Disasters – Climate Change and Urban Disasters.	
5	Week 5	Disaster Management Cycle and Framework Disaster Management Cycle – Paradigm Shift in Disaster Management. Pre-Disaster – Risk Assessment and Analysis, Risk Mapping, zonation, and Micro zonation,	
6	Week 6	Prevention and Mitigation of Disasters, Early Warning System; Preparedness, Capacity Development. Awareness During Disaster – Evacuation – Disaster Communication – Search and Rescue – Emergency	
7	Week 7	Operation Centre – Incident Command System – Relief and Rehabilitation Post-disaster – Damage and Needs Assessment, Restoration of Critical Infrastructure – Early Recovery – Reconstruction and Redevelopment; IDNDR, Yokohama Strategy, Hyogo Framework of Action.	
8	Week 8	Disaster Management in India Disaster Profile of India – Mega Disasters of India and Lessons Learnt. Disaster Management Act 2005 –	
9	Week 9	Role of Government (local, state, and national), Non-Government and Inter Governmental Agencies.	
10	Week 10	Applications of Science and Technology for Disaster Management Geo-informatics in Disaster Management (RS, GIS, GPS, and RS). Disaster Communication System (Early Warning and Its Dissemination).	
11	Week 11	Land Use Planning and Development Regulations, Disaster Safe Designs and Constructions, Structural and Non-Structural Mitigation of Disasters S&T Institutions for Disaster Management in India	
12	Week 12	Structural and Non-Structural Mitigation of Disasters S&T Institutions for Disaster Management in India	
13	Week 13	Institutional and Financial Mechanism, National Policy on Disaster Management, National Guidelines and Plans on Disaster Management.	
14	Week 14	Disaster Management Cycle and Framework Disaster Management Cycle – Paradigm Shift in Disaster Management	

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LESSON PLAN FOR DESIGN OF CAD/CAM LAB

Name of Teacher- Rohit Tiwari	Subject-CAD/CAM LAB	**Jan-May 2025**		Class- 6**th sem, ME**

S.NO.	WEEK	CONTENTS	REMARKS
1	Week 1	Introduction: Part modelling; Datum Plane; constraint; sketch; dimensioning; extrude; revolve; sweep; blend; protrusion;.	
2	Week 2	Extrusion; rib; shell; hole; round; chamfer; copy; mirror; assembly; align; orient	
3	Week 3	Exercises:3D Drawings of 1). Geneva Wheel ; 2). Bearing Block; 3). Bushed bearing:4). Gib and Cotter joint; 5).Screw Jack; 6). Connecting Rod:	
4	Week 4	CNC Programming and Machining: Introduction;1).Study of CNC lathe, milling; 2).Study of international standard codes: GCodes and M-Codes; 3).Format –Dimensioning methods	
5	Week 5	Program writing – Turning simulator – Milling simulator, IS practice – commands menus; 5). Editing the program in the CNC machines; 6). Execute the program in the CNC machines;	
6	Week 6	CNC Turning Machine:(Material: Aluminum/Acrylic/Plastic rod) 1. Using Linear and Circular interpolation-Create a part program and produce component in the Machine.	
7	Week 7	Using Stock removal cycle–Create a part program for multiple turning operations and produce component in the Machine.	
8	Week 8	Using canned cycle-Create a part program for thread cutting and produce component in the Machine.	
9	Week 9	CNC Milling Machine Using Linear interpolation and Circular interpolation–Create a part program for grooving and produce component in the Machine.	
10	Week 10	Using canned cycle-Create a part program for drilling, tapping, counter sinking and produce component in the Machine.	
11	Week 11	Using sub program-Create a part program for mirroring and produce component in the Machine.	
12	Week 12	Using Linear and Circular interpolation-Create a part program and produce component in the Machine.	
13	Week 13	Printing of the orthographic view and sectional view from the above assembled 3D drawing.(at least four drawings to be prepared)	
14	Week 14	Using canned cycle-Create a part program for grooving and produce component in the Machine.	

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LESSON PLAN FOR COMPUTER AIDED MACHINE DRAWING PRACTICE

Name of Teacher- Rohit Tiwari	Subject-COMPUTER AIDED MACHINE DRAWING PRACTICE	**Jan-May 2025**		Class- **4th sem, ME**

S.NO.	WEEK	CONTENTS	REMARKS
1	Week 1	Introduction to CAD software.	
2	Week 2	Introduction to CAD software.	
3	Week 3	Drawing aids and editing commands.	
4	Week 4	Drawing aids and editing commands.	
5	Week 5	Basic dimensioning, hatching, blocks and views.	
6	Week 6	Basic dimensioning, hatching, blocks and views.	
7	Week 7	Isometric drawing, printing and plotting	
8	Week 8	Machine Drawing practice using Auto CAD: Detailed drawings of following machine parts are to be given to the students to assemble and draw the sectional or plain elevations, plans and side views with dimensioning and bill of materials using cad software	
9	Week 9	Machine Drawing practice using Auto CAD: Detailed drawings of following machine parts are to be given to the students to assemble and draw the sectional or plain elevations, plans and side views with dimensioning and bill of materials using cad software	
10	Week 10	Sleeve & Cotter Joint Spigot & Cotter Joint Knuckle Joint Stuffing Box	
11	Week 11	Screw Jack	
12	Week 12	Foot Step Bearing Universal Coupling Plummer Block	
13	Week 13	Simple Eccentric, Machine Vice	
14	Week 14	Connecting Rod ,Protected Type Flanged Coupling.	

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