

CHHATISGARH INSTITUTE OF TECHNOLOGY JASHPUR

(छत्तीसगढ़ इंस्टीट्यूट ऑफ टेक्नोलॉजी जशपुर)

Vill. - Jhargaon, Post- Gholeng, Dist- Jashpur (Chhattisgarh) – 496338

Website- www.gpjashpur.ac.in

Email: govtpolyjashpur@gmail.com

LESSON PLAN SESSION JUL – DEC 2025

SUBJECT: MD,E&C

SEMESTER: 5th

BRANCH: - MECHANICAL ENGINEERING

SUBJECT CODE- 2037572(037)

UNIT NUMBER	NAME OF THE TOPIC	NO OF CLASS REQUIRED	REMARK
Unit 1.0 Fundamentals of Machine	1.1 Basic concepts of design in general. 1.2 Factors to be considered in design of machine components a. Selection of Mechanism b. Material c. Loading and Forces on the elements d. Size, shape and space requirements e. Manufacturing f. Operating requirement g. Reliability and safety aspects h. Inspectability i. Maintenance, cost and aesthetics of the designed product j. Failure criterion	04	
	1.3 Codes and Standards in Machine Design 1.4 Engineering Materials a. Properties and applications of common engineering materials. b. Important mechanical properties of materials: Elasticity, Plasticity, Hardness, Ductility, Malleability, Brittleness, Resilience Toughness, Creep etc.		
Unit 2.0 Design for Static Loading	2.1 & 2.2 Types of loads, Types of stresses, strains and strengths. Factor of safety and stress concentration factor.	02	
	2.3, 2.4&2.5 Design under static single axial loading conditions. Theories of failure. Design under static Multiaxial loading conditions.	04	
Unit 3.0 Design of Shaft, Axle, Keys and Couplings	3.1 Types of shafts, Shaft materials, Standard sizes. 3.2 Design of solid and hollow Shaft and Axles under twisting moment (TM), Bending Moment (BM). a. Geometric Layout b. Deflection and Rigidity c. Design procedure of solid and hollow shaft based on strength d. Design procedure of solid and hollow shaft based on stiffness.	03	
	3.3 Types of keys, effect of keyway on the strength of shaft, design of rectangular and square sunk key.	01	
	3.4 Design of Couplings (Muff coupling and Rigid Protected Flange coupling)	03	
Unit 4.0 Design of fasteners	4.1&4.2 Advantages and disadvantages of riveted Joints. Methods of riveting, types of rivet heads, Rivet material and properties, kinds of riveted joints	01	
	4.3 Failure of riveted joints, Design of riveted joints, efficiency of riveted joints (including eccentrically loaded)	04	

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	4.4 Boiler joints	01	
	4.5, 4.6&4.7 Types of welded joints, representation of welds. Design of welded joints for static loads. Strength of welded joints at varying loads.	3	
	4.8&4.9 Introduction to threaded joints, types of screw fastening, profile of screw threads, materials for fasteners. Design of bolted joints in various loading conditions (including eccentrically loaded)	3	
Unit 5.0 Antifriction Bearings	5.1 Classification of Bearings – Sliding contact and rolling contact.	01	
	5.2 Terminology of Ball and Roller bearings – life load relationship, basic static load rating and basic dynamic load rating.	03	
	5.3 Selection of ball bearings using manufacturer's catalogue.	01	
Unit 6- Fundamentals of Estimating and Costing	6.1 & 6.2 Definition and aims of Estimating, Functions of Estimating and role of Estimating department. Estimating Procedure and constituents of Estimation.	02	
	6.3,6.4 Definition and aims of Costing. Difference between Estimating and Costing.	02	
	6.5,6.6&6.7 Procedure of Costing, Costing Methods. Advantages of efficient costing. Elements of Cost- Material, labor, Expenses.	02	
	6.8&6.9 Direct and Indirect cost: Factory expenses, administrative expenses, selling expenses and distribution expenses. Components of cost	02	
Unit-7.0 Estimation and Costing Applications	7.1&7.2 Terminology used in machine shop like cutting speed, feed and depth of cut. Lathe Operations- Turning, Facing, Knurling, Drilling, Boring, Reaming, Threading and Tapping	02	
	7.3&7.4 Estimation of volume and weight of material. Use of formula to calculate actual machining time for different machining operations	03	
	7.5,7.6 & 7.7 Estimation of time related to Welding shop. Estimation of time related to Forging shop. Estimation of time related to Pattern making and Foundry shops	03	
Total Class Required		50	

Lecturer Name & Sign: -