

## LESSON PLAN

SUBJECT : MECHANICS OF MATERIAL (TH 3)

NAME OF FACULTY: SWAPNASHISH PATEL & SIPHON KUMAR PANDEY

SEMESTER: 3RD

YEAR: 2025-26 (25-26)

MONTH	CHAPTER/UNIT	COURSE TO BE COVERED	CLASSES REQUIRED (HOURS)	REMARKS
	<b>UNIT 1</b>	<b>Centre of Gravity and Moment of Inertia</b>	<b>8</b>	
	1.1	Definition of centre of gravity -Centre of gravity of of Symmetrical shapes ( solid / hollow square, rectangular, circular, I Sections)	1	
	1.2	Moment of inertia (M.I.): Definition, M.I. of plane lamina, Radius of gyration, section modulus, Parallel and Perpendicular axes theorems (without derivations), M.I. of rectangle, square, circle, semicircle, quarter circle and triangle section (without derivations).	2	
	1.3	M.I. of symmetrical and unsymmetrical I-section, Channel section, T-section, Angle section, Hollow sections and built up sections about centroidal axes and any other reference axis.	4	
	1.4	Polar Moment of Inertia of solid circular sections and problems	1	
	<b>UNIT 2</b>	<b>Simple Stresses and Strains</b>	<b>12</b>	
	2.1	Definition of rigid, elastic and plastic bodies, deformation of elastic body under various forces, Definition of stress, strain, elasticity, Hook's law, Elastic limit, Modulus of elasticity.	1	
	2.2	Type of Stresses-Normal, Direct, Bending and Shear and nature of stresses i.e. Tensile and Compressive stresses.	1	
	2.3	Standard stress strain curve for tor steel bar under tension, Yield stress, Proof stress, Ultimate stress, Strain at various critical points, Percentage elongation and Factor of safety.	1	
	2.4	Deformation of body due to axial force, forces applied at intermediate sections, Maximum and minimum stress induced, Composite section under axial loading.	2	



4.2	Concept of moment of resistance and simple numerical problems using flexural equation. Shear stress equation (without derivation), relation between maximum and average shear stress for rectangular and circular section, shear stress distribution diagram.	4	
4.3	Shear stress distribution for square, rectangular, circle, hollow, square, rectangular, circular, angle sections, channel section, I-section, T section. Simple numerical problems based on shear equation.	3	
<b>UNIT 5</b>	<b>Columns</b>	<b>6</b>	
5.1	Concept of compression member, short and long column, Effective length, Radius of gyration, Slenderness ratio, Types of end condition for columns, Buckling of axially loaded columns.	2	
5.2	Euler's theory, assumptions made in Euler's theory and its limitations, Application of Euler's equation to calculate buckling load.	2	
5.3	Rankine's formula and its application to calculate crippling load	1	
5.4	Concept of working load/safe load, design load and factor of safety.	1	
<b>45 HOURS</b>			

Signature of Faculty

Signature of HOD