LESSON PLAN OF 3RD SEMESTER(2025-26) CIVIL ENGINEERING

Discipline:- CIVIL ENGG.	Semester:- 3RD	Name of the Teaching Faculty SWAGATIKA SAMAL (LECTURER)
Subject:- MECHANICS OF MATERIAL(CEPC205)	No of Days/per Week Class Allotted :-04	Semester From:- 14/07/2025 To:- 15/11/2025 No of Weeks:- 18
Week	**Class Day**	**Theory/ Practical Topics**
1st	1st	**UNIT-I Centre of Gravity and Moment of Inertia** Definition of centre of gravity -Centre of gravity of of Symmetrical shapes solid / hollow Square)
	2nd	Problem practice
	3rd	Center of gravity of rectangular, circular, I Section
	4th	Problem practice
2nd	1st	Moment of inertia (M.I.): Definition, M.I. of plane lamina,
	2nd	Radius of gyration, section mod- ulus,
	3rd	Parallel and Perpendicular axes theorems (without derivations)
	4th	Problem practice
3rd	1st	Problem practice
	2nd	M.I. of rectangle, square, circle, semicircle
	3rd	M.I ofquarter circle and triangle section (without derivations).
	4th	Problem practice
4th	1st	M.I. of symmetrical and unsymmetrical I-section
	2nd	M.I ofChannel section, T-section, Angle section
	3rd	Hollow sections and built up sections about centroidal axes and any other reference axis.
	4th	Problem practice
5th	1st	Problem practice
	2nd	Polar Moment of Inertia of solid circular sections
	3rd	**UNIT-II Simple Stresses and Strains** Definition of rigid, elastic and plastic bodies
	4th	Deformation of elastic body under various forces,
6th	1st	Definition of stress, strain, elasticity,
	2nd	Hook's law, Elastic limit,
	3rd	Modulus of elastic-ity.
	4th	Type of Stresses-Normal, Direct, Bending and Shear and nature of stresses
7th	1st	Tensile and Compressive stresses
	2nd	Standard stress strain curve for tor steel bar under tension
	3rd	Yield stress, Proof stress, Ultimate stress
	4th	Strain at various critical points
8th	1st	Percentage elongation and Factor of safety.
	2nd	Problem practice
	3rd	Deformation of body due to axial force
	4th	forces applied at intermediate sections,
9th	1st	Maximum and minimum stress induced, Composite section under axial loading
	2nd	Concept of temperature stresses and strain
	3rd	Stress and strain developed due to temperature variation in homogeneous simple bar (no composite section)
	4th	Longitudinal and lateral strain, Modulus of Rigidity, Poisson's ratio,

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10th	1st	Biaxial and tri-axial stresses, volumetric strain, change in volume
	2nd	Relation between modulus of elasticity, modulus of rigidity and bulk modulus (without derivation).
	3rd	**COMPLEX STRESSES AND STRAINS: Principal stresses and strains:**
	4th	Occurrence of normal and tangential stresses - Concept of Principal stress and Principal Planes
11th	1st	major and minor principal stresses and their orientations – stresses on a given plane
	2nd	shear and normal stress components on any inclined plane
	3rd	Mohr's circle and its use in solving problems on complex stresses
	4th	Numerical problems
12th	1st	**UNIT-IIIShear Force and Bending Moment**
	2nd	Types of supports, beams and loads
	3rd	Concept and definition of shear force and bending moment
	4th	Relation between load, shear force and bending moment (without derivation).
13th	1st	Shear force and bending moment diagram for cantilever and simply supported beams subjected to point loads,
	2nd	uniformly distributed loads and couple (combination of any two types of loading), point of contra flexure.
	3rd	**UNIT-IV Bending and Shear Stresses in beams** Concept and theory of simple bending
	4th	assumptions, flexural equation (without derivation),
14th	1st	Problem practice bending stresses and their nature, bending stress distribution diagram.
	2nd	Concept of moment of resistance and simple numerical problems using flexural equation.
	3rd	Shear stresss equation (without derivation),
	4th	relation between maximum and average shear stress for rectangular and circular section, shear stress distribution diagram.
15th	1st	Problem practice
	2nd	Shear stress distribution for square, rectangular, circle, hollow, square
	3rd	rectangular, circular, angle sections, channel section, I-section
	4th	Simple numerical problems based on shear equation.
16th	1st	**UNIT-V COLUMNS** Concept of member
	2nd	short and long column, Effective length,
	3rd	Radius of gy- ration, Slenderness ratio,
	4th	Types of end condition for columns, Buckling of axially loadedcolumns
17th	1st	Euler's theory, assumptions made in Euler's theory and its limitations
	2nd	Application of Eu- ler's equation to calculate buckling load
	3rd	Problem practice
	4th	Problem practice
18th	1st	Rankine' s formula and its application to calculate crippling load.
	2nd	its application to calculate crippling load.
	3rd	Concept of working load/safe load, design load and factor of safety.
	4th	Problem practice

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