



LESSON PLAN OF 3RD SEMESTER(2026-27) CIVIL ENGINEERING

Discipline: CIVIL ENGG. Subject: MECHANICS OF MATERIAL(CEPC205)	Semester: 3 RD No of Days/per Week Class Allotted :-04	Name of the Teaching Faculty SWAGATIKA SAMAL (LECTURER) Semester From:- <u>01/07/2026</u> To:- <u>05/11/2026</u> No of Weeks:- 19
Week	Class Day	Theory/ Practical Topics
1 st	1 st	UNIT-I Centre of Gravity and Moment of Inertia Definition of centre of gravity -Centre of gravity of of Symmetrical shapes solid / hollow Square)
	2 nd	Problem practice
	3 rd	Center of gravity of rectangular, circular, I Sections
	4 th	Problem practice
2 nd	1 st	Moment of inertia (M.I.): Definition, M.I. of plane lamina,
	2 nd	Radius of gyration, section modulus,
	3 rd	Parallel and Perpendicular axes theorems (without derivations)
	4 th	Problem practice
3 rd	1 st	Problem practice
	2 nd	M.I. of rectangle, square, circle, semicircle
	3 rd	M.I. of quarter circle and triangle section (without derivations).
	4 th	Problem practice
4 th	1 st	M.I. of symmetrical and unsymmetrical I-section
	2 nd	M.I. of Channel section, T-section, Angle section
	3 rd	Hollow sections and built up sections about centroidal axes and any other reference axis.
	4 th	Problem practice
5 th	1 st	Problem practice
	2 nd	Polar Moment of Inertia of solid circular sections
	3 rd	UNIT-II Simple Stresses and Strains Definition of rigid, elastic and plastic bodies
	4 th	deformation of elastic body under various forces,
6 th	1 st	Definition of stress, strain, elasticity,
	2 nd	Hook's law, Elastic limit,
	3 rd	Modulus of elasticity.
	4 th	Type of Stresses-Normal, Direct, Bending and Shear and nature of stresses
7 th	1 st	Tensile and Compressive stresses.
	2 nd	Standard stress strain curve for low carbon steel bar under tension
	3 rd	Yield stress, Proof stress, Ultimate stress
	4 th	Strain at various critical points
8 th	1 st	Percentage elongation and Factor of safety.
	2 nd	Problem practice
	3 rd	Deformation of body due to axial force
	4 th	forces applied at intermediate sections,
9 th	1 st	Maximum and minimum stress induced, Composite section under axial loading
	2 nd	Concept of temperature stresses and strain
	3 rd	Stress and strain developed due to temperature variation in homogeneous simple bar (no composite section)
	4 th	Longitudinal and lateral strain, Modulus of Rigidity, Poisson's ratio,
10 th	1 st	Biaxial and tri-axial stresses, volumetric strain, change in volume
	2 nd	Relation between modulus of elasticity, modulus of rigidity and bulk modulus (without derivation).
	3 rd	COMPLEX STRESSES AND STRAINS Principal stresses and strains:
	4 th	Occurrence of normal and tangential stresses - Concept of Principal stress and Principal Planes

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

S. Samal
23.06.26
LECTURER

[Signature]
PRINCIPAL 23/6/26

Principal
GIET (Polytechnic)
Jagatpur, Cuttack

[Signature]
23.06.2026
SR.LECTURER
Sr. Lecturer
Civil Engg. Dept.
G.I.E.T(Poly), Jagatpur, Ctc