

Lesson Plan

Course - Mechanics of Material (Th-3)

Semester- 3rd

Program- Civil Engineering

Institute - Govt. Polytechnic, Sonpur

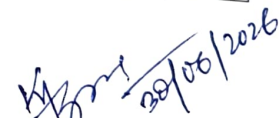
Session - 2026-2027

Sl. No.	Week No.	Class No.	Topic to be Covered
1	1	Class 1	Unit I: Introduction to Centre of Gravity (CG), Definition of CG
2	1	Class 2	Centre of Gravity of Symmetrical Shapes – Solid/Hollow Square, Rectangle, Circle
3	1	Class 3	Centre of Gravity of I-Sections
4	2	Class 1	Moment of Inertia (M.I.) – Definition, Plane Lamina, Radius of Gyration
5	2	Class 2	Section Modulus, Parallel Axis Theorem, Perpendicular Axis Theorem
6	2	Class 3	M.I. of Rectangle, Square and Circle
7	3	Class 1	M.I. of Semicircle, Quarter Circle and Triangle
8	3	Class 2	M.I. of Symmetrical and Unsymmetrical I-Sections, Channel Sections
9	3	Class 3	M.I. of T-Section, Angle Section, Hollow & Built-up Sections, Polar M.I. of Solid Circular Section
10	4	Class 1	Unit II: Rigid, Elastic and Plastic Bodies, Deformation of Elastic Bodies
11	4	Class 2	Stress, Strain, Elasticity, Hooke's Law, Elastic Limit, Modulus of Elasticity
12	4	Class 3	Types of Stress – Normal, Direct, Bending, Shear, Tensile and Compressive
13	5	Class 1	Stress-Strain Curve of Tor Steel, Yield Stress, Proof Stress
14	5	Class 2	Ultimate Stress, Critical Points, Percentage Elongation, Factor of Safety
15	5	Class 3	Deformation due to Axial Force, Intermediate Loading, Maximum & Minimum Stress
16	6	Class 1	Composite Sections under Axial Loading
17	6	Class 2	Temperature Stress and Strain in Homogeneous Bars
18	6	Class 3	Longitudinal & Lateral Strain, Poisson's Ratio, Modulus of Rigidity
19	7	Class 1	Biaxial & Triaxial Stress, Volumetric Strain, Bulk Modulus
20	7	Class 2	Relation between E, G and K (without derivation)
21	7	Class 3	Principal Stress & Principal Planes – Concepts
22	8	Class 1	Major & Minor Principal Stresses, Orientation of Principal Planes
23	8	Class 2	Normal & Shear Stress on Inclined Planes

24	8	Class 3	Mohr's Circle and Numerical Problems
25	9	Class 1	Unit III: Types of Supports, Beams and Loads
26	9	Class 2	Shear Force and Bending Moment – Concepts and Definitions
27	9	Class 3	Relationship between Load, Shear Force and Bending Moment
28	10	Class 1	S.F. & B.M. Diagrams for Cantilever with Point Load and UDL
29	10	Class 2	S.F. & B.M. Diagrams for Simply Supported Beams
30	10	Class 3	Couple Loading, Combined Loading and Point of Contraflexure
31	11	Class 1	Unit IV: Pure Bending – Concept, Theory and Assumptions
32	11	Class 2	Flexural Equation, Bending Stress and Stress Distribution
33	11	Class 3	Moment of Resistance and Numerical Problems
34	12	Class 1	Shear Stress Equation, Maximum & Average Shear Stress
35	12	Class 2	Shear Stress Distribution in Rectangular and Circular Sections
36	12	Class 3	Shear Stress Distribution in Square, Hollow and Circular Sections
37	13	Class 1	Shear Stress Distribution in Angle, Channel, I and T Sections
38	13	Class 2	Numerical Problems based on Shear Stress Equation
39	13	Class 3	Revision of Bending and Shear Stress Concepts
40	14	Class 1	Unit V: Compression Members, Short and Long Columns
41	14	Class 2	Effective Length, Radius of Gyration, Slenderness Ratio, End Conditions
42	14	Class 3	Buckling of Columns, Euler's Theory, Assumptions and Limitations
43	15	Class 1	Euler's Equation and Numerical Problems on Buckling Load
44	15	Class 2	Rankine's Formula, Crippling Load and Numerical Problems
45	15	Class 3	Working Load, Safe Load, Design Load, Factor of Safety and Course Revision


 Signature of Faculty
 Civil Engg, GP Sonpur


 Signature of HOD
 Civil Engg, GP Sonpur


 Academic Co-ordinator
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