Gopal Krishna College of Engineering and Technology

Goura Hari Vihar, PO: Raniput, Jeypore-764005

Lesson Plan (2025–2026)

Name of the Subject: Mechanics of Solid
Name of the Faculty: Er. Pabani Patra
Semester: 3rd **Branch:** Civil Engineering
Semester From: July to Dec **No. of Weeks:** 15 Weeks

Module 1 (Week 1–4)

Week	Class Day	Chapter
1st	1st	Introduction to Stress and Strain
	2nd	Stress Tensor, Normal and Shearing Stress
	3rd	Normal and Shearing Strains
2nd	1st	Stress-Strain Relationship and Hooke's Law
	2nd	Poisson's Ratio and Material Properties
	3rd	Stress-Strain Diagram for Ductile and Brittle Materials
3rd	1st	Strain Gauges and Rosettes
	2nd	Testing of Materials using Universal Testing Machine
	3rd	Composite Bars in Tension and Compression
4th	1st	Temperature Stresses
	2nd	Numerical Problems on Stress and Strain
	3rd	Revision and Tutorial

Module 2 (Week 5–7)

Week	Class Day	Chapter
5th	1st	Two Dimensional State of Stress and Strain
	2nd	Principal Stresses and Principal Strains
	3rd	Principal Axes and Numerical Problems
6th	1st	Mohr's Circle for Stress Analysis
	2nd	Calculation of Principal Stress from Principal Strain
	3rd	Thin Cylinders under Internal Pressure
7th	1st	Thin Spherical Shells under Internal Pressure
	2nd	Applications and Problem Solving
	3rd	Revision and Assignment Discussion

Module 3 (Week 8–10)

Week	Class Day	Chapter
8th	1st	Shear Force and Bending Moment
	2nd	Support Reactions for Statically Determinate Beams
	3rd	SFD and BMD for Simple Beams
9th	1st	Theory of Pure Bending
	2nd	Distribution of Normal and Shear Stress
	3rd	Beams of Two Materials
10th	1st	Deflection of Beams by Integration Method

	2nd	Area Moment Method
	3rd	Numerical Problems and Revision

Module 4 (Week 11–12)

Week	Class Day	Chapter
11th	1st	Torsion of Solid Circular Shafts
	2nd	Twisting Moment and Strength of Shafts
	3rd	Strength of Hollow Circular Shafts
12th	1st	Combined Bending and Twisting
	2nd	Closed Coiled Helical Springs
	3rd	Tutorial and Numerical Problems

Module 5 (Week 13–15)

Week	Class Day	Chapter
13th	1st	Buckling of Columns and Euler's Theory
	2nd	Columns with Various End Conditions
	3rd	Slenderness Ratio
14th	1st	Eccentric Loading of Columns
	2nd	Columns with Initial Curvature
	3rd	Numerical Problems on Columns
15th	1st	Revision
	2nd	Doubt Clearing Session
	3rd	Internal Assessment / Viva

Books

1. Strength of Materials, G. H. Ryder, McMillan India Ltd.
2. Elements of Strength of Materials, S. P. Timoshenko & D. H. Young, East West Press Pvt. Ltd.
3. Introduction to Solid Mechanics, H. Shames, Prentice Hall India.
4. Mechanics of Materials by Beer and Johnston, Tata McGraw Hill.