

**GOVERNMENT POLYTECHNIC JAJPUR**

A/ P: Ragadi, Block: Korei, Dist.: Jajpur, Odisha- 755019

Website: <https://www.gpjajpur.org> E-mail: [principalgpjajpur@yahoo.co.in](mailto:principalgpjajpur@yahoo.co.in) Contact: 9437155107**LESSON PLAN (2021-22)**

<b>Discipline :</b>	<b>Semester:</b>	<b>Name of the Teaching Faculty:</b>
<b>Mechanical</b>	<b>3rd</b>	<b>Mahesh Kumar Patra</b>
Subject:	No. Of Days/Week	Semester From Date: 01/10/2021 To Date:31/01/2022
<b>Strength of Material</b>	Class Allotted	No. Of Weeks: 15
<b>Week</b>	<b>Class Day</b>	<b>Theory/Practical Topics</b>
1st	1st	Introduction to Strength of Material. Types of load, stresses & strains (Axial and tangential). Application of SOM
	2nd	Poisson's ratio, Lateral and Linear strain. Numerical to find stress, strain, elongation and Poisson's ratio.
	3rd	Hooke's law. Young's modulus, bulk modulus, modulus of rigidity. Relation between E&G, E&K
	4th	Relation between three elastic constants. Numerical
2nd	1st	Principle of super position. Numerical
	2nd	Stresses in composite section. Numerical
	3rd	Temperature stress and strain Temperature stress in composite bar (single core). Numerical
	4th	Strain energy and resilience, stress due to gradually applied, suddenly applied and impact load
3rd	1st	Review class
	2nd	<i>Assignment Evaluation &amp; Class Test</i>
	3rd	Introduction to Thin cylinder and spherical shell. Assumption for thin cylindrical shell. Hoop and longitudinal stress and strain.
	4th	Determination of hoop stress and longitudinal stress.
4th	1st	Numerical to find safe pressure, thickness and diameter.
	2nd	Determination of Hoop strain, longitudinal strain and volumetric strain
	3rd	Determination of Change in length, diameter and volume of thin cylindrical shell.
	4th	Numerical to find change in dimensions of thin cylindrical shell.
5th	1st	Review class
	2nd	<i>Assignment Evaluation &amp; Class Test</i>
	3rd	Introduction to 2-dimensional stress system; Concept of

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		Principal plane, Principal stress and strain; Stresses in oblique plane
	4th	Determination of normal stress, shear stress and resultant stress on an oblique plane of a body which subjected to (i) direct stress in one direction only. Numerical
6th	1st	Determination of normal stress, shear stress and resultant stress on an oblique plane of a body which subjected to (ii) direct stress in two perpendicular directions. Numerical
	2nd	Determination of normal stress, shear stress and resultant stress on an oblique plane of a body which subjected to (iii) shear stress only; Numerical
	3rd	Determination of normal stress, shear stress and resultant stress on an oblique plane of a body which subjected to (iv) direct stress in one direction and followed by shear stress. Problem
	4th	Determination of normal stress, shear stress and resultant stress on an oblique plane of a body which subjected to (iv) direct stress in two perpendicular directions and followed by shear stress. Problem.
7th	1st	Concept of Mohr's circle. Mohr's circle Problems.
	2nd	Mohr's circle Problems.
	3rd	Review class
	4th	<i>Assignment Evaluation &amp; Class Test</i>
8 <sup>th</sup>	1st	Types of beam and load. Concepts of Shear force and bending moment.
	2nd	Sign convention. Relationship between SF, BM and Loading
	3rd	Numerical to determine Shear Force and Bending moment diagram in cantilever beam subjected to point load.
	4th	Numerical to determine Shear Force and Bending moment diagram in cantilever beam subjected to U.D.L
9 <sup>th</sup>	1st	Numerical to determine Shear Force and Bending moment diagram in simply supported beam subjected to point load.
	2nd	Numerical to determine Shear Force and Bending moment diagram in simply supported beam subjected U.D.L.
	3rd	Numerical to determine Shear Force and Bending moment diagram in overhanging beam subjected to point load.
	4th	Numerical to determine Shear Force and Bending moment diagram in overhanging beam subjected U.D.L.
10 <sup>th</sup>	1st	Review class
	2nd	<i>Assignment Evaluation &amp; Class Test</i>
	3rd	Introduction to Theory of simple bending. Assumptions in the theory of bending
	4th	Neutral axis, Theory of simple bending
11 <sup>th</sup>	1st	Moment of resistance, Bending equation

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	2nd	Section modulus of rectangular and circular beam sections
	3rd	Numerical
	4th	Numerical
12 <sup>th</sup>	1st	Review class
	2nd	<i>Assignment Evaluation &amp; Class Test</i>
	3rd	Define column, types of column. Axial load, Eccentric load on column
	4th	Direct stresses, Bending stresses, Maximum & Minimum stresses in short column: for uniaxial system
13 <sup>th</sup>	1st	Direct stresses, Bending stresses, Maximum & Minimum stresses in short column: for biaxial system
	2nd	Numerical
	3rd	Buckling load computation using Euler's formula (no derivation) in Columns with various end conditions
	4th	Review class
14 <sup>th</sup>	1st	<i>Assignment Evaluation &amp; Class Test</i>
	2nd	Torsion in shafts, Assumption of pure torsion
	3rd	Theory of pure torsion
	4th	Torsion equation for solid and hollow circular shaft, Numerical
15 <sup>th</sup>	1st	Comparison between solid and hollow shaft subjected to pure torsion, torsional rigidity, Numerical
	2nd	Numerical
	3rd	Review class
	4th	<i>Class Test</i>

01/10/21

(MkPah)