GOVERNMENT POLYTECHNIC JAJPUR
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DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (2023-2024)		
Discipline: Mechanical	**Semester: 3RD**	**Name of the Teaching faculty: GITANJALI SETHI**
Subject: Strength of Material (Th-2)	**No of Days/ Week class alloted: 4**	**Semester from Date:** 01. 08 . 2023 To Date: 31.11.2023 **No of weeks:** 15
Week	**Class Day**	**Topics**
1st	1st	**CH. 1 SIMPLE STRESS & STRAIN.** Types of load, stresses & strains,(Axial and tangential)
	2nd	Hooke's law, Young's modulus
	3rd	bulk modulus, modulus of rigidity, Poisson's ratio, derive the relation between three elastic constants,
	4th	Numerical on above
2nd	1st	Principle of super position,Stresses in composite section
	2nd	Numerical on above.
	3rd	Temperature stress ,Determine Temperature stress in compositebar (single core).
	4th	Numerical on above.
3rd	1st	Strain energy and resilience, Stress due to gradually applied load.
	2nd	Stress due to suddenly applied and impact load
	3rd	**CH. 2 Thin cylinder and spherical shell under internal pressure.** Definition of Hoop and longitudinal stress and strain.
	4th	Derivation of Hoop stress and longitudinal stress
4th	1st	Numerical on above.
	2nd	Derivation of Hoop strain, longitudinal strain and volumetric strain
	3rd	Numerical on above.
	4th	Computation of Change in length, diameter and volume
	1st	Numerical on above.
5th	2nd	Revision and test
	3rd	**CH. 3. Two dimensional stress system.** Introduction to 2-dimensional stress system; Concept of 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

6th	1st	Determination of normal stress, shear stress and resultant stress on an oblique plane of a body
	2nd	Numerical on above.
	3rd	Location of principal plane and computation of principal stress
	4th	Location of principal plane and computation of principal stress
7th	1st	Numerical on above.
	2nd	Location of principal plane and computation of principal stress and Maximum shear stress using Mohr's circle
	3rd	Numerical on above.
	4th	Numerical on above.
8th	1st	**CH.-4 Bending moment and shear force.**
		Types of beam and load.
	2nd	Concept of shear force and bending moment.
	3rd	Shear Force and Bending moment diagram and its salient features illustration in cantilever beam subjected to point load.
	4th	Shear Force and Bending moment diagram and its salient features illustration in cantilever beam subjected to U.D.L.
9th	1st	Shear Force and Bending moment diagram and its salient features illustration in simply supported beam subjected to point load.
	2nd	Shear Force and Bending moment diagram and its salient features illustration in simply supported beam subjected to U.D.L
	3rd	Shear Force and Bending moment diagram and its salient features illustration in Over hanging beam subjected to point load.
	4th	Shear Force and Bending moment diagram and its salient features illustration in Over hanging beam subjected to U.D.L.
10th	1st	Numerical on above.
	2nd	Revision and test
	3rd	**CH. 5 Theory of simple bending.**
		Assumptions in the theory of bending
	4th	Bending equation
11th	1st	Moment of resistance,
	2nd	Introduction to Theory of simple bending,
	3rd	Section modulus
	4th	Neutral axis
12th	1st	Numerical on above.
	2nd	**CH. 6. Combined direct and bending stress.**
		Define column,types of column
	3rd	Axial load, Eccentric load on column.
	4th	Direct stresses, Bending stresses, Maximum & Minimum stresses
13th	1st	Numerical on above.
	2nd	Buckling load computation using Euler's formula (no derivation) in Columns with various end conditions
	3rd	Numerical on above.Revision and test
	4th	**CH. 7. Torsion.**
		Assumption of pure torsion

14th	1st	Torsion equation for solid and hollow circular shaft
	2nd	Numerical on above.
	3rd	Comparison between solid and hollow shaft subjected to pure torsion
	4th	Numerical on above.
15th	1st	Revision and test
	2nd	Previous year question discussion.
	3rd	Previous year question discussion.
	4th	VST

Learning resources:

Sl. No.	Author	Title of the book	Publisher
01	S Ramamrutham	Strength of Materials	Dhanpat Rai
02	R K Rajput	Strength of Materials	S.Chand
03	R.S khurmi	Strength of Materials	S.Chand
04	G H Ryder	Strength of Materials	Mc millon and co. lmtd
05	S Timoshenko and D H Young	Strength of Materials	TMH

31.7.23

Signature of Faculty

G. Sethi.

Sr. Lect. Mech.