

GOVERNMENT POLYTECHNIC, KORAPUT
DEPARTMENT OF MECHANICAL ENGINEERING

Discipline:
**MECHANICAL
ENGG**

Semester:
3RD

Name of the Teaching Faculty: **SHARMILA SARDAR**

Subject:
**STRENGTH OF
MATERIAL**

No. of
days/per
week
class
allotted: 4

Semester From date: **5/9/20**

To Date: **17/3/21**

No. of Weeks: 15

**COURSE
OUTCOMES**

Students will develop ability towards

1. Determination of stress, strain under uniaxial loading (due to static or impact load and temperature) in simple and single core composite bars.
2. Determination of stress, strain and change in geometrical parameters of cylindrical and spherical shells due to pressure
3. Realization of shear stress besides normal stress and computation of resultant stress in two dimensional objects.
4. Drawing bending moment and shear force diagram and locating points in a beam where the effect is maximum or minimum.
5. Determination of bending stress and torsional shear stress in simple cases
6. Understanding of critical load in slender columns thus realizing combined effect of axial and bending load.

Week	Class Day	Theory/Practical Topics
1 ST	1 ST	Load, types of loads, stress & types of stresses
	2 ND	Strain, types of strains, hookes law, young's modulus of elasticity
	3 RD	Bulk's modulus, modulus of rigidity, poison's ratio, properties of materials
	4 TH	Stress -strain diagram for ductile & brittle materials
2 ND	1 ST	Relation between elastic constants
	2 ND	Principle of superposition & related numerical
	3 RD	Stresses in composite section
	4 TH	Temperature stress, temperature stress in composite bar
3 RD	1 ST	Strain energy, resilience, stress due to gradually applied, suddenly applied & impact load.
	2 ND	Continued..
	3 RD	Numericals
	4 TH	Pressure vessels, classification of pressure vessels, hoop stress & longitudinal stress
4 TH	1 ST	Derivation of hoop stress & longitudinal stress
	2 ND	Derivation of hoop strain, longitudinal strain & volumetric strain
	3 RD	Computation of change in length, diameter & volume
	4 TH	Derivation of stress & strain in spherical vessel
5 TH	1 ST	Numericals
	2 ND	Numericals

	3 RD	Stress on oblique plane, determination of normal stress, shear stress resultant stress on oblique plane subjected to direct stress in one direction
	4 TH	Determination of stresses on oblique plane subjected to direct stress in two directions
6 TH	1 ST	Determination of stresses on oblique plane subjected to direct stress & shear stress
	2 ND	Continued...
	3 RD	Principal stress & principal strains
	4 TH	Continued...
7 TH	1 ST	Mohr's circle
	2 ND	Mohr's circle
	3 RD	Numericals
	4 TH	Numericals
8 TH	1 ST	Bems, types of beams & loads
	2 ND	Concept of shear force & bending moment

	3 RD	Shear force & bending moment diagram for cantilever beam
	4 TH	Continued
9 TH	1 ST	Simply supported beam
	2 ND	Simply supported beam
	3 RD	Simply supported beam
	4 TH	Simply supported beam
10 TH	1 ST	Overhanging beam
	2 ND	Overhanging beam
	3 RD	Simple bending & assumptions on the theory of simple bending
	4 TH	Bending equation
11 TH	1 ST	Bending equation
	2 ND	Bending equation
	3 RD	Moment of resistance & neutral axis
	4 TH	Section modulus
12 TH	1 ST	Numericals
	2 ND	Numericals
	3 RD	Numericals
	4 TH	Numericals
13 TH	1 ST	Column, axial load, eccentric load, buckling load
	2 ND	Direct stresses, bending stresses, maximum & minimum stress
	3 RD	Continued...
	4 TH	Numericals
14 TH	1 ST	Numericals
	2 ND	Buckling load using Euler's formula for different columns
	3 RD	Torsion, assumption of pure torsion
	4 TH	Torsion equation
15 TH	1 ST	Torsion equation for hollow & solid circular shaft
	2 ND	Comparison between solid & hollow shaft subjected to pure torsion
	3 RD	Numericals
	4 TH	Numericals

READING RESOURCES:

- 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

Sign. Of Faculty
concerned


Principal

Sharmela Babbar
Sign. Of HOD /C