NM INSTITUTE OF ENGINEERING & TECHNOLOGY

BHUBANESWAR

Mechanical Engineering Department

LESSON PLAN

Session 2022-2023

Semester: 3RD

Subject: STRENGTH OF MATERIAL

Faculty Name: RABINARAYAN BAG

Week	Class Day	Theory topics
1	1	Introduction to Simple stress & strain.
	2	Types of load, stresses & strains,(Axial and tangential) Hooke's law.
	3	Young's modulus, bulk modulus
	4	Derive the relation between three elastic constants.
2	1	Principle of super position.
	2	Stresses in composite section.
	3	Temperature stress, determine the temperature stress in composite bar (single core).
	4	Strain energy and resilience.
3	1	Stress due to gradually applied, suddenly applied and impact load.
	2	Simple problems on above.
	3	Introduction to Thin cylinder.
	4	Introduction to spherical shell under internal pressure.
4	1	Definition of hoop and longitudinal stress, strain
	2	Derivation of hoop stress, longitudinal stress, hoop strain,
	3	Derivation of longitudinal strain and volumetric strain.
	4	Solving previous year questions.
5	1	Computation of the change in length, diameter and volume
	2	Solving Simple problems on above
	3	Introduction to Two dimensional stress systems.
	4	Determination of normal stress on oblique plane.
6	1	Determination of shear stress on oblique plane.
	2	Determination of resultant stress on oblique plane.
	3	Derive Location of principal plane
	4	Computation of principal stress.
7	1	Location of principal plane and computation of principal stress.
	2	Computation of Maximum shear stress using Mohr's circle.
	3	Solving previous year questions.
	4	Introduction to Bending moment.

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Week	Class Day	Theory topics
8	1	Introduction to shear force.
	2	Types of beam and load
	3	Concepts of Shear force and bending moment.
	4	Explain about SF & BM Diagram.
9	1	Shear Force and Bending moment diagram and its salient features illustration in cantilever beam.
	2	Cantilever beam with point load.
	3	Cantilever beam with uniformly distributed load.
	4	Simply supported beam under point load.
10	1	Simply supported beam under uniformly distributed load.
	2	Over hanging beam under point load.
	3	Over hanging beam under uniformly distributed load.
	4	Solving previous year questions.
11	1	Introduction to Theory of simple bending.
	2	Assumptions in the theory of bending.
	3	Derivation of bending equation.
	4	Derive position of neutral axis.
12	1	Moment of resistance
	2	Section modulus
	3	Bending stress in symmetrical section.
	4	Solving previous year questions.
13	1	Introduction to Combined direct & bending stresses.
	2	Define column
	3	Eccentric loading.
	4	Axial load on column.
14	1	Direct stresses, Bending stresses, Maximum& Minimum stresses.
	2	Numerical problems on above
	3	Buckling load computation using Euler's formula in Columns with various end conditions(no derivation)
	4	Assumption of pure torsion.
15	1	The torsion equation for solid circular shaft.
	2	The torsion equation for hollow circular shaft.
	3	Comparison between solid and hollow shaft subjected to pure torsion.
	4	Solving previous year questions.

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