

Discipline: Mechanical Engg.	Semester:3 RD Session:2026 (W)	Name of the Teaching Faculty: BANESWAR MUNDA Designation: Senior Lecturer
Subject: SOM-TH2 (MEPC203)	No. of days/week class allotted:03	Semester From date: 01.07.2026 To date: 05.11.2026 No. of weeks: 15
Week	Class Day	Theory/Practical Topics
	CHAPTER: 01	Simple Stress and Strain.
1st	1 st	Types of load, stresses & strains, (Axial and tangential)
	2 nd	Hooke's law, Young's modulus, bulk modulus, Poisson's ratio
	3 rd	Mechanical properties of common engineering materials;
2nd	1 st	Significance of various points on stress – strain diagram for M.S. and C.I. specimens;
	2 nd	Relation between elastic constants
	3 rd	Stress and strain values in bodies of uniform section and of composite section under the influence of normal forces
3rd	1 st	Thermal stresses in bodies of uniform section and composite sections; Related numerical problems on the above topics
	2 nd	Strain Energy: Strain energy or resilience, proof resilience and modulus of resilience
	3 rd	Derivation of strain energy for the following cases: i) Gradually applied load, ii) Suddenly applied load, iii) Impact/ shock load
4 TH	CHAPTER: 02	Shear force and Bending moment Diagrams
	1 st	Types of beams with examples: a) Cantilever beam, b) Simply supported beam, c) Over hanging beam, d) Continuous beam, e) Fixed beam
	2 nd	Types of Loads – Point load, UDL and UVL; Definition and explanation of shear force and bending moment;
5 TH	3 rd	Calculation of shear force and bending moment and drawing the S.F and B.M. diagrams by the analytical method
	1 st	e S.F and B.M. diagrams by the analytical method only for the following cases: a) Cantilever with point loads
	2 nd	SF & BM diagrams for Cantilever with uniformly distributed load
6 TH	3 rd	SF & BM diagrams for Simply supported beam with point loads, d) Simply supported beam with UDL,
	1 st	SF & BM diagrams for Over hanging beam with point loads, at the center and at free ends
	2 nd	SF & BM diagrams for Over hanging beam with UDL throughout
7 TH	3 rd	SF & BM diagrams for Combination of point and UDL for the above; Related numerical problems.
	CHAPTER: 03	Theory of simple bending and Deflection of beams
	1 st	Explanation of terms: Neutral layer, Neutral Axis, Modulus of Section
8 TH	2 nd	Explanation of terms: Moment of Resistance, Bending stress, Radius of curvature
	3 rd	Assumptions in theory of simple bending; Bending Equation $M/I = \sigma/Y = E/R$
	1 st	Equation $M/I = \sigma/Y = E/R$ with derivation; Problems Involving calculations of bending stress, modulus of section and moment of resistance
	2 nd	$M/I = \sigma/Y = E/R$ derivation; Problems involving calculations of bending stress, modulus of section and moment of resistance
	3 rd	Calculation of safe loads and safe span and dimensions of crossection
	1 st	Definition and explanation of deflection as applied to beams;

9 TH	2 nd	Deflection formulae without proof for cantilever and simply supported beams with point load ,Related numerical problems.
	3 rd	Deflection formulae without proof simply supported beams with UDL only, Related numerical problems.
	CHAPTER: 04	Torsion in Shafts and Springs
10 TH	1 st	Derivation of the equation $T/J = fs/R = G\theta/L$
	2 nd	Problems on design of shaft based on strength and rigidity;
	3 rd	Numerical Problems related to comparison of strength and weight of solid and hollow shafts
11 TH	1 st	Classification of springs; Nomenclature of closed coil helical spring
	2 nd	Deflection formula for closed coil helical spring (without derivation); stiffness of spring
	3 rd	Numerical problems on closed coil helical spring to find safe load, deflection, size of coil and number of coils.
	CHAPTER: 05	Thin Cylindrical Shells
11 TH	1 st	Thin cylindrical shell, Purpose and material of thin cylindrical shell
	2 nd	Explanation of longitudinal stresses in the light of circumferential shell
	3 rd	Explanation of hoop stresses in the light of circumferential shell
12 TH	1 st	Explanation of longitudinal in the light of longitudinal failure of shell
	2 nd	Explanation of hoop stresses in the light of circumferential of shell
	3 rd	Derivation of expressions for the longitudinal and hoop stress for seamless shells
13 TH	1 st	Derivation of expressions for the longitudinal and hoop stress for seam shells
	2 nd	Related numerical Problems for safe thickness and safe working pressure.
	3 rd	Doubt clearing class on the above topic
14 TH	1 st	Revision of Chapter 1 & 2.
	2 nd	Revision of Chapter 2 & 3.
	3 rd	Revision of Chapter 4 & 5.
15 TH	1 st	Previous year questions discussion
	2 nd	Previous year questions discussion
	3 rd	Previous year questions discussion
		TOTAL CLASS=45

Baneswar Munda

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Academic Co-ordinator

