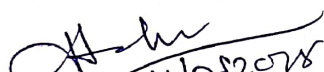


<b>Discipline:</b> Mechanical Engineering	<b>Semester :</b> 3 <sup>rd</sup> Semester 2025-2026 Dt-15/07/2025 To 15/11/2025	<b>Name of the Teaching Faculty:</b> Mrs. Shradha Suman Adabar (Lect. Mech. Engg)
<b>Subject:</b> Strength Of material	<b>No. of Days/week</b> <b>Class Allotted: 45</b>	<b>No of weeks:</b> 18
<b>week</b>	<b>Class Day</b>	<b>Theory Topics</b>
1 <sup>st</sup>	1 <sup>st</sup>	Types of forces; Stress, Strain and their nature; Mechanical properties of common engineering materials;
	2 <sup>nd</sup>	Significance of various points on stress – strain diagram for M.S. and C.I. specimens; Significance of factor of safety; Relation between elastic constants;
	3 <sup>rd</sup>	Stress and strain values in bodies of uniform section and of composite section under the influence of normal forces; Thermal stresses in bodies of uniform section and composite sections
2 <sup>nd</sup>	1 <sup>st</sup>	Related numerical problems on the above topics.
	2 <sup>nd</sup>	Strain Energy: Strain energy or resilience, proof resilience and modulus of resilience; Derivation of strain energy for the following cases: i) Gradually applied load,
	3 <sup>rd</sup>	ii) Suddenly applied load, iii) Impact/ shock load; Related numerical problems.
3 <sup>rd</sup>	1 <sup>st</sup>	Problem practice
	2 <sup>nd</sup>	Types of beams with examples: a) Cantilever beam, b) Simply supported beam, c) Over hanging beam, d) Continuous beam, e) Fixed beam;
	3 <sup>rd</sup>	beam, b) Simply supported beam, c) Over hanging beam, d) Continuous beam, e) Fixed beam; Types of Loads – Point load, UDL and UVL; Definition and explanation of shear force and bending moment;
4 <sup>th</sup>	1 <sup>st</sup>	Calculation of shear force and bending moment and drawing the S.F and B.M. diagrams by the analytical method only for the following cases: a) Cantilever with point loads
	2 <sup>nd</sup>	Calculation of shear force and bending moment and drawing the S.F and B.M. diagrams by the analytical method only for the following cases b) Cantilever with uniformly distributed load,
	3 <sup>rd</sup>	c) Simply supported beam with point loads,
5 <sup>th</sup>	1 <sup>st</sup>	d) Simply supported beam with UDL
	2 <sup>nd</sup>	e) Over hanging beam with point loads, at the center and at free ends
	3 <sup>rd</sup>	f) Over hanging beam with UDL throughout

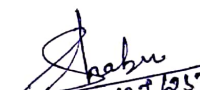


6th	1st 2nd 3rd	(ii) Continuation of part (i) of the above; Related numerical problems. Problem practice on SFD & BMF Problem practice on SFD & BMF
7th	1st 2nd 3rd	Explanation of terms: Neutral layer, Neutral Axis, Modulus of Section, Moment of Resistance, Bending stress, Radius of curvature, Definition and explanation of deflection as applied to beams; Assumptions in theory of simple bending; Bending Equation $M/I = \sigma/y = E/R$ with derivation
8th	1st 2nd 3rd	Problems involving calculations of bending stress, modulus of section and moment of resistance Problem practice Problem practice
9th	1st 2nd 3rd	Calculation of safe loads and safe span and dimensions of cross-section; Problem practice Deflection formulae without proof for cantilever and simply supported beams with point load and UDL only (Standard cases only); Related numerical problems.
10th	1st 2nd 3rd	Continue.. Problem practice Problem practice
11th	1st 2nd 3rd	Definition and function of shaft; Calculation of polar M.I. for solid and hollow shafts; Classification of springs; Nomenclature of closed coil helical spring; stiffness of spring; Continue.. Assumptions in simple torsion; Derivation of the equation $T/J = f_s/R = G\theta/L$
12th	1st 2nd 3rd	Continue.. Problems on design of shaft based on strength and rigidity Problem practice
13th	1st 2nd 3rd	Numerical Problems related to comparison of strength and weight of solid and hollow shafts Deflection formula for closed coil helical spring (without derivation); Numerical problems on closed coil helical spring to find safe load, deflection, size of coil and number of coils.
14th	1st	Explanation of longitudinal and hoop stresses in the light of circumferential and

15 <sup>th</sup>	1 <sup>st</sup>	Derivation of expressions for the longitudinal and hoop stress for seamless and seam shells;
	2 <sup>nd</sup>	Related numerical Problems for safe thickness and safe working pressure.
	3 <sup>rd</sup>	Problem practice
16 <sup>th</sup>	1 <sup>st</sup>	Problem practice
	2 <sup>nd</sup>	Revision chapter-1
	3 <sup>rd</sup>	Revision chapter-1
17 <sup>th</sup>	1 <sup>st</sup>	Revision chapter-2
	2 <sup>nd</sup>	Revision chapter-2
	3 <sup>rd</sup>	Revision chapter-3
18 <sup>th</sup>	1 <sup>st</sup>	Revision chapter-4
	2 <sup>nd</sup>	Revision chapter-4
	3 <sup>rd</sup>	Revision chapter-5

  
14/7/2018

**SIGNATURE OF THE FACULTY**

  
14/07/18

**SIGNATURE OF H.O.D.**