Lesson Plan (Theory)

Branch	Mechanical Engineering	Semester : 4th
Subject	Strength of materials	Session : : Feb-June,2023

S.NO.	MONTH	WEEK	DAY	PARTICULARS	Remarks
1	FEB	3RD	15,16,17	Concept of load, stresses and strain,Tensile compressive and shear stresses and strains,Concept of Elasticity, Elastic limit and limit of proportionality.Hook's Law,Young Modulus of elasticity, Nominal stress,Yield point, plastic stage,Strain hardening,Ultimate strength and breaking stress,Percentage elongation,Proof stress and working stress,Factor of safety,Shear modulus.	
		4TH	20,22,23,24	Strain energy due to direct stresses,Proof resilience and modulus of resilience, Stresses due to gradual, sudden and falling load.	
		5TH	27	Longitudinal and circumferential stresses in seamless thin walled cylindrical shells.	
2	MARCH	1ST	1,2,3	Numerical Problems on the above topic, Concept of moment of inertia and second moment of area, Radius of gyration, Second moment of area of common geometrical sections: Rectangle, Triangle, Circle (without derivation).	
		2ND	6,9,10	Second moment of area for L, T and I section, Section modulus, Numerical Problems based on the above concepts.	
		3RD	13,15,16,17	Bending and shearing force,Concept of beam, form of loading, Concept of end supports Roller, hinged and fixed. Concept of bending moment and shearing force, B.M. and S.F. Diagram for cantilever.	CT1
		4TH	20,22,23,24	Numercial prolems on the above topics, B.M and S.F diagram for simply supported beams with and without overhang subjected to concentrated and U.D.L.	
		5TH	27,29,31	Numercial prolems on the above topics, Bending stresses, Concept of Bending stresses, Bending Equation, Theory of simple bending	
3	APRIL	1ST	***	***	
		2ND	3,5,6	Use of the equation f/y = M/I = E/R,Concept of moment of resistance Numerical problems, Numerical problems based on the above concept, Bending stress diagram,	
		3RD	10,12,13	Calculation of maximum bending stress in beams of rectangular, circular, I and T section, Permissible bending stress Section modulus for rectangular, circular and symmetrical I section Numerical problems	CT2
		4TH	17,19,20,21	Concept of column, modes of failure, Types of columns,Buckling load, crushing load, Slenderness ratio, Factors effecting strength of a column, End restraints, Effective length, Strength of column by Euler Formula. Numerical problems	
		5TH	24,26,27,28	Rankine Gourdan formula, Combined direct and bending stresses, Simple cases of short columns of uniform section subjected to eccentric loading with stress diagram. Numerical problems	
4	MAY	1ST	1,3,4	Concept of torsion- difference between torque and torsion, Torsion equation. Use of torque equation for circular shaft. Numerical problems	
		2ND	8,10,11,12	HOUSE TEST	
		3RD	15,17,18,19	Comparison between solid and hollow shaft with regard to their strength and weight. Power transmitted by shaft, Concept of mean and maximum torque. Numerical problems	
		4TH	24,25,26	Closed coil helical springs subjected to axial load and impact load, Stress deformation, Stiffness and angle of twist and strain energy,Proof resilience.	
		5TH	29,31	Numerical problems on the above topics,	
5	JUNE	1ST	1,2	Laminated Spring (Semi elliptical type only) Determination of number of plates,	
		2ND	5,7,8,9	Maximum bending stress and deflection, Numerical problems on the above topics.	

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