

Government Polytechnic Arwal, Arwal

LECTURE PLAN

DIPLOMA SEMESTER 3RD

Subject(code) : Mechanics of Solids (1625303)					
Name : Dhananjay kumar					
Department of Mechanical Engineering					
Units	Topics	Lecture No.	Weeks	Lecture Modes	Remarks
1. Mechanical properties of materials, Simple stresses and Strains	1.1 Introduction, Types of load, Simple stress and Strain, Thermal stress, Hoop stress and corresponding strain	1	1	Google meet/ video/pdf/ppt	
		2			
	1.2 Volumetric strain, Bulk modulus Hooke's law, Young's modulus and Modulus of rigidity.	3	2	Google meet/ video/pdf/ppt	
		4			
	1.3 Poisson's ratio, Stress-strain curve for ductile and brittle material.	5	3	Google meet/ video/pdf/ppt	
		6			
	1.4 Stresses and strains in thin cylindrical shell, stresses and strains in thin spherical shell.	7	4	Google meet/ video/pdf/ppt	
		8			
	1.5 Buckling, Rankine and Euler's formulae for buckling loads for column under compression, Concept of various end conditions.	9	5	Google meet/ video/pdf/ppt	
		10		Google meet/ video/pdf/ppt	
1.6 Concept of slope and deflection of beams, Relation between bending moment and slope.	11	6	Google meet/ video/pdf/ppt		
1.7 Deflection of simply supported beams and cantilever beams subjected to point load.	12		Google meet/ video/pdf/ppt		
2. Strain energy	2.1 Concept and Derivation for deformation of axially loaded members under gradual, sudden and impact load.	13	7	Google meet/ video/pdf/ppt	
		14			
	2.2 Strain energy due to self weight, Numericals	15	8	Google meet/ video/pdf/ppt	
		16			
2. Bending Moment & Shear force	3.1 Shear force, Bending moment, Relation between them.	17		Google meet/ video/pdf/ppt pdf/ppt	

3. Bending Moment & Shear force	3.2 SFD and BMD diagram for subjected to different loading condition.	18	9	video/pdf/ppt	
	3.3 Location of point of contraflexure, Numericals on SFD & BMD.	19		video/pdf/ppt	
4. Moment of Inertia	4.1 Definition ,MOI for Laminae, Radius of Gyration	20	10	Googlemeet/ video/pdf/ppt	
	4.2 Parallel & perpendicular Axis theorem	21	12	video/pdf/ppt	
	4.3 Moment of inertia of different sections Polar Moment of Inertia,Numericals	22		video/pdf/ppt	
5. Bending and Shear Stresses	5.1 Theory and Equation of bending, Assumptions of bending.	23	13	Google meet/ video/pdf/ppt	
	5.2 MOR,Section Modulus & Neutral axis	24		Google meet/ video/pdf/ppt	
		25			
5.3 Concept of Direct and Transverse Shear Stress	26	14	Google meet/ video/pdf/ppt		
6. Combination of Bending & Direct stresses	6.1 Axial & eccentric Load, Direct Stresses, maximum & minimum bending stresses	27	15	Google meet/ video/pdf/ppt	
		28			
	6.2 Combined stresses use for C-clamp, Bench vice, Drilling machine	29	16	Google meet/ video/pdf/ppt	
6.3 Condition for no tension at extreme fibres,total stress variation diagrams.	30		Google meet/ video/pdf/ppt		
7. Principal Planes & Principal Stresses	7.1 Definition of principal plane & principal stresses	31	17	Google meet/ video/pdf/ppt	
	7.2 Expression for normal and tangential stresses, maximum shear stress	32		Google meet/ video/pdf/ppt	
		33	18	Google meet/ video/pdf/ppt	
	7.3 Stresses on inclined planes, Position of Principal planes & planes of maximum shear.	34		Google meet/ video/pdf/ppt	
		35	19	Google meet/ video/pdf/ppt	
7.4 Graphical solution using Mohr's circle of stresses, Numericals	36		Google meet/ video/pdf/ppt		
8. Torsion	8.1 Concept of Pure Torsion, Assumptions of pure Torsion, Torsion equation for solid and hollow circular shaft	38	20	video/pdf/ppt	
		39		video/pdf/ppt	
	8.2 Comparison between Solid and Hollow shafts subjected to pure torsion.	40	21	Google meet/video/ pdf/ppt	