

LESSON PLAN

Discipline: Civil Engineering		Name of The Teaching Faculty: BHAGABATA JENA				
Subject: Structural mechanics (TH1)		Semester From Date: 01-08-2023 To Date 30-11-2023				
SEMESTER-3rd		No. Of Weeks: 16		5P/WEEK		
No. of Days/week class allotted: 05 period per week (Tue, Wed, Thu, Fri, Sat-1 Period each)					TOTAL PERIOD-75	
MONT H	Week	DATE	DAYS	Syllabus to be covered	NO. OF PERIODS AVAILABLE	
				1. Review Of Basic Concepts	4	
AUG	1ST	01-08-2023	Tue	Basic Principle of Mechanics: Force, Moment, support conditions, Conditions of equilibrium,	1	
		02-08-2023	Wed	C.G & MI, Free body diagram	1	
		03-08-2023	Thu	Review of CG and MI of different sections	1	
		04-08-2023	Fri	Numerical problems	1	
				2. Simple And Complex Stress, Strain	15	
		05-08-2023	Sat	2.1 Simple Stresses and Strains	1	
	2ND	08-08-2023	Tue	Introduction to stresses and strains: Mechanical properties of materials – Rigidity, Elasticity, Plasticity, Compressibility, Hardness, Toughness, Stiffness, Brittleness, Ductility, Malleability, Creep, Fatigue, Tenacity, Durability,	1	
		09-08-2023	Wed	Types of stresses - Tensile, Compressive and Shear stresses, Types of strains - Tensile, Compressive and Shear strains, Complimentary shear stress - Diagonal tensile / compressive Stresses due to shear, Elongation and Contraction, Longitudinal and Lateral strains,	1	
		10-08-2023	Thu	Poisson's Ratio, Volumetric strain, computation of stress, strain, Poisson's ratio, change in dimensions and volume etc, Hooke's law - Elastic Constants, Derivation of relationship between the elastic constants	1	
		11-08-2023	Fri	Numerical problems	1	
		12-08-2023	Sat	2.2 Application of simple stress and strain in engineering field:		
		3RD	16-08-2023	Wed	Behaviour of ductile and brittle materials under direct loads, Stress Strain curve of a ductile material, Limit of proportionality, Elastic limit, Yield stress, Ultimate stress, Breaking stress,	1
			17-08-2023	Thu	Percentage elongation, Percentage reduction in area,	1
	18-08-2023		Fri	Numerical problems	1	
	19-08-2023		Sat	Deformation of prismatic bars due to uniaxial load	1	
	4TH	22-08-2023	Tue	Deformation of prismatic bars due to its self weight.	1	
				2.3 Complex stress and strain		
		23-08-2023	Wed	Principal stresses and strains: Occurrence of normal and	1	
		24-08-2023	Thu	Concept of Principal stress and Principal Planes	1	
		25-08-2023	Fri	major and minor principal stresses and their	1	

		26-08-2023	Sat	Mohr's Circle and its application to solve problems of	1	
	5TH	29-08-2023	Tue	Numerical problems	1	
		31-08-2023	Thu	Numerical problems	1	
				3.Stresses In Beams and Shafts	10	
SEP	1ST	01-09-2023	Fri	Stresses in beams due to bending: Bending stress in	1	
		02-09-2023	Sat	Curvature of beam – Position of N.A. and Centroidal	1	
	2ND	05-09-2023	Tue	Shear stresses in beams: Shear stress distribution in	1	
		07-09-2023	Thu	Numerical problems	1	
		08-09-2023	Fri	Stresses in shafts due to torsion: Concept of torsion,	1	
		09-09-2023	Sat	Torsion of solid and hollow circular sections, polar	1	
	3RD	12-09-2023	Tue	Torsional shearing stresses, angle of twist, torsional	1	
		13-09-2023	Wed	Combined bending and direct stresses: Combination of	1	
		14-09-2023	Thu	Numerical problems	1	
		15-09-2023	Fri	Conditions for no tension, Limit of eccentricity, Middle	1	
				4.Columns and Struts	4	
	4TH	16-09-2023	Sat	Columns and Struts	1	
		21-09-2023	Thu	Definition Short and Long columns, End conditions	1	
		22-09-2023	Fri	Equivalent length / Effective length, Slenderness ratio,	1	
			23-09-2023	Sat	Euler's theory of long columns, Critical load for Columns	1
	5TH				5.Shear Force and Bending Moment	12
					5.1 Types of loads and beams:	
		26-09-2023	Tue	Types of Loads: Concentrated (or) Point load, Uniformly	1	
		27-09-2023	Wed	Types of Supports: Simple support, Roller support,	1	
		28-09-2023	Thu	Types of Reactions: Vertical reaction, Horizontal	1	
		30-09-2023	Sat	Calculation of support reactions using equations of	1	
OCT	2ND			5.2 Shear force and bending moment in beams:		
		03-10-2023	Tue	Shear Force and Bending Moment: Signs Convention for	1	
		04-10-2023	Wed	B.M of general cases of determinate beams with	1	
		05-10-2023	Thu	S.F and B.M diagrams for Cantilevers, Simply supported	1	
		06-10-2023	Fri	Numerical problems	1	
	3RD	07-10-2023	Sat	Numerical problems	1	
		10-10-2023	Tue	Numerical problems	1	
		11-10-2023	Wed	Position of maximum BM, Point of contra flexure	1	
		12-10-2023	Thu	Relation between intensity of load, S.F and B.M.	1	
				6.Slope and Deflection	10	
		13-10-2023	Fri	Introduction: Shape and nature of elastic curve	1	
	4TH	14-10-2023	Sat	Relationship between slope, deflection and curvature	1	
		17-10-2023	Tue	Class test	1	
		18-10-2023	Wed	Slope and deflection of cantilever and simply supported	1	
		19-10-2023	Thu	Slope and deflection of cantilever and simply supported	1	
6TH	20-10-2023	Fri	Slope and deflection of cantilever and simply supported	1		
	31-10-2023	Tue	Slope and deflection of cantilever and simply supported	1		
1ST	01-11-2023	Wed	Numerical problems	1		
	02-11-2023	Thu	Numerical problems	1		
			7.Indeterminate Beams	10		
	03-11-2023	Fri	Indeterminacy in beams	1		
	04-11-2023	Sat	Principle of consistent deformation/compatibility	1		
	07-11-2023	Tue	Principle of consistent deformation/compatibility	1		
	08-11-2023	Wed	Analysis of propped cantilever beam by principle of	1		

NOV	2ND	09-11-2023	Thu	Analysis of fixed beam by principle of superposition	1
		10-11-2023	Fri	Analysis of two span continuous beams by principle of	1
		11-11-2023	Sat	SF diagrams (point load and udl covering full span)	1
	3RD	14-11-2023	Tue	BM diagrams (point load and udl covering full span)	1
		15-11-2023	Wed	BM diagrams (point load and udl covering full span)	1
		16-11-2023	Thu	Numerical problems	1
				8.Trusses	10
		17-11-2023	Thu	Introduction	1
		18-11-2023	Fri	Types of trusses	1
		21-11-2023	Sat	statically determinate and indeterminate trusses	1
	4TH	22-11-2023	Tue	Degree of indeterminacy	1
		23-11-2023	Wed	Stable and unstable trusses	1
		24-11-2023	Thu	Advantages of trusses.	1
		25-11-2023	Fri	Analysis of trusses: Analytical method (Method of	1
	5TH	28-11-2023	Sat	Analysis of trusses: Analytical method (Method of	1
		29-11-2023	Tue	Analysis of trusses: Analytical method (Method of	1
		30-11-2023	Wed	Numerical problems	1