

Lesson Plan

Name of the Faculty:

Discipline: CIVIL ENGINEERING

Semester: 3rd SEM

Subject: STRUCTURAL MECHANICS

Work Load (Lecture/Practical) per week (in hours): Lectures- , Practicals-

Week	Theory		Practical	
	Lecture day	Topic (including assignment/test)	Practical day	Topic
1 st	1 st	About subject	1 st	
	2 nd	Properties of Materials		
	3 rd	Classification of materials, elastic materials, plastic materials, ductile Materials, brittle materials.		
	4 th	Introduction to tensile test, compressive test, impact test, fatigue test, torsion test on metals.		
2 nd	5 th	Concept of stress, normal and shear stresses,	2 nd	
	6 th	Concept of strain and deformation, longitudinal and transverse strain, poisson's ratio, volumetric strain		
	7 th	Hooke's law, moduli of elasticity and rigidity, Bulk modulus of elasticity, relationship between the elastic constants.		
	8 th	Stresses and strains in bars subjected to tension and compression. Extension of uniform bar under its own weight,		
3 rd	9 th	stress produced in compound bars (two or three) due to axial load.	3 rd	
	10 th	Stress-strain diagram for mild steel and HYSD steel, mechanical properties, factor of safety.		
	11 th	Temperature stresses and strains		
	12 th	Concept of a beam and supports (Hinges, Roller and Fixed), types of beams: simply supported, cantilever		
4 th	13 th	propped, over hang, cantilever and continuous beams (only concept).	4 th	

	14 th	Types of loads (dead load, live load, snow load, wind load seismic load as per IS Codes etc) and types of loading (point, uniformly distributed and uniformly varying loads)		
	15 th	Concept of bending moment and shear force, sign conventions		
	16 th	Bending Moment and shear force diagrams for cantilever, simply supported		
5 th	17 th	Relationship between load, shear force and bending moment, point of maximum bending moment, and point of contra flexure.	5 th	
	18 th	overhanging beams subjected to concentrated, uniformly distributed		
	19 th	CH. 1,2,3 TEST		
	20 th	Concept of moment of inertia and second moment of area and radius of gyration, theorems of parallel and perpendicular axis		
6 th	21 st	second moment of area of common Geometrical sections: rectangle, triangle, circle. Second Moment of area for L, T and I sections, section modulus.	6 th	
	22 nd	Concept of pure/simple bending		
	23 rd	Assumptions made in the theory of simple bending, derivation and application of bending equation to circular cross-section, I section, T&L sections only		
	24 th	Moment of resistance Calculations of bending stresses in simply supported beam		
7 th	25 th	Concentric and eccentric loads single axis eccentricity only	7 th	
	26 th	Effect of eccentric load on the section stresses due to eccentric loads, Numerical in the case of short columns.		
	27 th	Simple problems on stability of masonry dams and retaining walls		

	28 th	numerical problems)		
8 th	29 th	Concept of shear stresses in beams, shear stress distribution in rectangular	8 th	
	30 th	circular I, T, L sections (Formula to be stated, no derivation)		
	31 st			
	32 nd	Slope and Deflection:		
9 th	33 rd	Necessity for determination of slope and deflection	9 th	
	34 th	numerical problems)		
	35 th	numerical problems)		
	36 th	Moment area theorem		
10 th	37 th	Theory of columns	10 th	
	38 th	Eulers and Rankine Formula		
	39 th	Concept of a perfect, redundant and deficient frames		
	40 th	Concept of a perfect, redundant and deficient frames		
11 th	41 st	Assumptions and analysis of trusses	11 th	
	42 nd	numerical problems)		
	43 rd	Method of joints		
	44 th	Method of sections		
12 th	45 th	Graphical method	12 th	
	46 th	numerical problems		
	47 th	numerical problems		
	48 th	numerical problems		
13 th	49 th	Slope and Deflection:	13 th	
	50 th	Numerical Problems		
	51 st	Slope and Deflection:		
	52 nd	Numerical Problems		
14 th	53 rd	Graphical method	14 th	
	54 th	Method of sections		
	55 th	Numerical Problems		
	56 th	CH. 7,8,9 TEST		
15 th	57 th	Numerical Problems	15 th	
	58 th	1 ST SESIONAL REVISION		
	59 th	2 ND SESIONAL REVISION		
	60 th	3 RD SESIONAL REVISION		