

LESSON PLAN OF TH.1 STRUCTURAL DESIGN– II

Discipline: Civil Engineering	Semester : 5TH	Name of the Teaching Faculty: ER. BAISALI SAMANTRAI
Week	Class Day	Theory/ Practical Topics
1ST		1.0 Introduction
	1ST	1.1 Common steel structures, Advantages & disadvantages of steel structures. 1.2 Types of steel, properties of structural steel.
	2ND	1.3 Rolled steel sections, special considerations in steel design. 1.4 Loads and load combinations
	3RD	1.5 Structural analysis and design philosophy. 1.6 Brief review of Principles of Limit State design.
		2.0 Structural Steel Fasteners and Connections
	4TH	2.1 Bolted Connections. 2.1.1 Classification of bolts, advantages and disadvantages of bolted connections.
	5TH	2.1.2 Different terminology, spacing and edge distance of bolt holes
2ND	1ST	2.1.3 Types of bolted connections. 2.1.4 Types of action of fasteners, assumptions and principles of design.
	2ND	2.1.5 Strength of plates in a joint, strength of bearing type bolts (shear capacity& bearing capacity), reduction factors, and shear capacity of HSFG bolts.
	3RD	2.1.6 Analysis & design of Joints using bearing type and HSFG bolts (except eccentric load and prying forces) 2.1.7 Efficiency of a joint.
	4TH	2.2 Welded Connections: 2.2.1 Advantages and Disadvantages of welded connection. 2.2.2 Types of welded joints and specifications for welding.
	5TH	2.2.3 Design stresses in welds.
3RD	1ST	2.2.4 Strength of welded joints. 2.2.5 Reduction of design stresses for long joints
		3.0 Design of Steel tension Members
	2ND	3.1 Common shapes of tension members.
	3RD	3.2 Design strength of tension members
	4TH	Questions and Answer
	5TH	3.2 Yielding of gross cross section
4TH	1ST	rupture of critical section and the concept of block shear.
	2ND	3.3 Maximum values of effective slenderness ratio.
	3RD	3.4 Analysis and Design of tension members.
	4TH	Questions and Answer
		4.0 Design of Steel Compression members
	5TH	4.1 Common shapes of compression members.
5TH	1ST	Discussion from IS 800 code
	2ND	4.2 Bulking class of cross sections and slenderness ratio.

	3RD	Questions and Answer
	4TH	4.3 Design compressive stress and strength of compression members.
	5TH	Questions and Answer
6TH	1ST	4.4 Analysis of compression members (axial load only).
	2ND	Questions and Answer
	3RD	4.4 Design of compression members (axial load only)
	4TH	Questions and Answer
		5.0 Steel Column bases and foundations
	5TH	5.1 Types of column bases and their suitability
7TH	1ST	5.2 Design of slab base (subjected to axial loading) with concrete footing.
	2ND	Discussion from IS 800 code
	3RD	Questions and Answer
	4TH	5.3 Design of gusseted base (subjected to axial loading) with concrete footing.
	5TH	Discussion from IS 800 code
8TH	1ST	Questions and Answer
	2ND	Questions and Answer
		6.0 Design of Steel beams
	3RD	6.1 Common cross sections and their classification.
	4TH	6.2 Plastic moment capacity of sections, moment capacity and shear resistance.
	5TH	Questions and Answer
9TH	1ST	6.3 Deflection limits, web buckling and web crippling.
	2ND	6.4 Design of laterally supported beams against bending and shear
	3RD	Questions and Answer
	4TH	6.5 Types of built up sections and design of simple built up sections using flange plates with I-sections or web plates.
	5TH	Questions and Answer
10TH		7.0 Design of Tubular Steel structures
	1ST	7.1 Round tubular sections, permissible stresses.
	2ND	7.2 Tube columns and compression members, crinkling.
	3RD	7.3 Tube tension members and tubular roof trusses.
	4TH	7.4 Joints in tubular trusses
	5TH	7.5 Design of tubular beams and purlins.
11TH	1ST	Questions and Answer
		8.0 Design of Timber Structures
	2ND	8.1 Types of timber, grading of timber, defects
	3RD	permissible stresses.
	4TH	8.2 Design of axially loaded timber columns (solid, box & built up section except spaced columns).
	5TH	Questions and Answer
12TH	1ST	Questions and Answer
	2ND	8.3 Design of simple timber structural elements in flexure (Solid sections & flitched beams, form factor)

13TH	3RD	Questions and Answer
	4TH	moment of resistance of built-up sections
	5TH	Questions and Answer
	1ST	check for shear
	2ND	bearing and deflection
15TH	3RD	Questions and Answer
		9.0 Design of Masonry Structures
	4TH	9.1 Design consideration for masonry walls (a) Load bearing walls -Permissible stresses
	5TH	Slenderness ratio, Effective length
	1ST	Questions and Answer
16TH	2ND	Effective height, Effective thickness
	3RD	Questions and Answer
	4TH	Eccentricity of loads, Grade of mortar
	5TH	Questions and Answer
	1ST	(b) Non-Load bearing walls – Panel walls, Curtain walls, Partition walls.
	2ND	9.2 Design consideration for masonry columns, piers and buttresses.
	3RD	Questions and Answer
	4TH	9.3 Design considerations for masonry wall footings.
	5TH	Questions and Answer

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