

ACADEMIC SESSION : WINTER- 2025

Discipline : CIVIL ENGG	Semester : 5TH	Name of the Teaching Faculty : RITWIK PATTNAIK Lecturer Stage I
Subject : Structural Design-2	No. of days / week class allotted	Semester Duration: 14/07/2025 to 15/11/2025 Nos. of Weeks per semester : 18
Week	Class Day	Theory/ Practical Topics
1 ST	1 st	Common steel structures, Advantages & disadvantages of steel structures.
	2 nd	Types of steel, properties of structural steel.
	3 rd	Rolled steel sections, special considerations in steel design.
	4 th	Loads and load combinations
2 ND	1 st	Structural analysis and design philosophy. Brief review of Principles of Limit State design.
	2 nd	Classification of bolts, advantages and disadvantages of bolted connections.
	3 rd	Different terminology, spacing and edge distance of bolt holes.
	4 th	Different terminology, spacing and edge distance of bolt holes.
3 RD	1 st	Types of bolted connections.
	2 nd	Types of bolted connections.
	3 rd	Related problems
	4 th	Related problems
4 TH	1 st	Types of action of fasteners, assumptions and principles of design.
	2 nd	Strength of plates in a joint, strength of bearing type bolts (shear capacity & bearing capacity), reduction factors, and shear capacity of HSFG bolts.
	3 rd	Analysis & design of Joints using bearing type and HSFG bolts (except eccentric load and prying forces)
	4 th	Efficiency of a joint.
5 TH	1 st	Welded Connections:
	2 nd	Advantages and Disadvantages of welded connection
	3 rd	Advantages and Disadvantages of welded connection
	4 th	Types of welded joints and specifications for welding Design stresses in welds. Strength of welded joints

6 TH	1 st	Types of welded joints and specifications for welding Design stresses in welds. Strength of welded joints
	2 nd	Related problems
	3 rd	Design of Steel tension Members
	4 th	Design of Steel tension Members
7 TH	1 st	Common shapes of tension members.
	2 nd	Maximum values of effective slenderness ratio.
	3 rd	Analysis and Design of tension members.(Considering strength only and concept of block shear failure.)
	4 th	Analysis and Design of tension members.(Considering strength only and concept of block shear failure.)
8 TH	1 st	Analysis and Design of tension members.(Considering strength only and concept of block shear failure.)
	2 nd	Analysis and Design of tension members.(Considering strength only and concept of block shear failure.)
	3 rd	Analysis and Design of tension members.(Considering strength only and concept of block shear failure.)
	4 th	Analysis and Design of tension members.(Considering strength only and concept of block shear failure.)
9 TH	1 st	Analysis and Design of tension members.(Considering strength only and concept of block shear failure.)
	2 nd	Design of Steel Compression members
	3 rd	Common shapes of compression members.
	4 th	Common shapes of compression members.
10 TH	1 st	Buckling class of cross sections, slenderness ratio
	2 nd	Buckling class of cross sections, slenderness ratio
	3 rd	Design compressive stress and strength of compression members.
	4 th	Design compressive stress and strength of compression members.
11 TH	1 st	Design compressive stress and strength of compression members.
	2 nd	Analysis and Design of compression members (axial load only).
	3 rd	Analysis and Design of compression members (axial load only).
	4 th	Design of Steel beams:
12 th	1 st	Common cross sections and their classification
	2 nd	Common cross sections and their classification
	3 rd	Deflection limits, web buckling and web crippling.
	4 th	Deflection limits, web buckling and web crippling.
13 th	1 st	Deflection limits, web buckling and web crippling.
	2 nd	Design of laterally supported beams against bending and shear.

	3 rd	Design of laterally supported beams against bending and shear.
	4 th	Design of laterally supported beams against bending and shear.
14 th	1 st	Design of laterally supported beams against bending and shear.
	2 nd	Design of Tubular Steel Structures:
	3 rd	Round Tubular Sections, Permissible Stresses
	4 th	Tubular Compression & Tension Members
15 th	1 st	Tubular Compression & Tension Members
	2 nd	Joints in Tubular trusses
	3 rd	Joints in Tubular trusses
	4 th	Design of Masonry Structures:
16 th	1 st	Design considerations for Masonry walls & Columns
	2 nd	Design considerations for Masonry walls & Columns
	3 rd	Numericals
	4 th	Numericals
17 th	1 st	Load Bearing & Non-Load Bearing walls
	2 nd	Load Bearing & Non-Load Bearing walls
	3 rd	Permissible stresses
	4 th	Slenderness Ratio, Effective Length
18 th	1 st	Numericals
	2 nd	Revision
	3 rd	Revision
	4 th	Revision

Prepared By

Ritvik Pattnaik
14/7/25

Approved by

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14/7/25

HOD(Civil)