

# LESSON PLAN OF 5<sup>TH</sup> SEMESTER CIVIL ENGINEERING(2023-24)

Discipline :- CIVIL	Semester:-5 <sup>TH</sup>	Name of the Teaching Faculty SWASTIK PRADHAN
Subject:- STRUCTURAL DESIGN- II	No of Days/per Week Class Allotted :-04	Semester From:- <u>1<sup>st</sup> August 2023</u> To:- <u>30<sup>th</sup> November, 2023</u> No of Weeks:- 18
Week	Class Day	Theory/ Practical Topics
1 <sup>st</sup>	1 <sup>st</sup>	1.0 Introduction: Common steel structures, Advantages & disadvantages of steel structures. Types of steel, properties of structural steel.
	2 <sup>nd</sup>	Rolled steel sections, special considerations in steel design. Loads and load combinations.
	3 <sup>rd</sup>	Structural analysis and design philosophy. Brief review of Principles of Limit State design
	4 <sup>th</sup>	2.0 Structural Steel Fasteners and Connections Classification of bolts, advantages and disadvantages of bolted connections.
2 <sup>nd</sup>	1 <sup>st</sup>	Different terminology, spacing and edge distance of bolt holes. Types of bolted connections.
	2 <sup>nd</sup>	Types of action of fasteners, assumptions and principles of design. Strength of plates in a joint, strength of bearing type bolts (shear capacity & bearing capacity)
	3 <sup>rd</sup>	reduction factors, and shear capacity of HSFG bolts. Analysis & design of Joints using bearing type and HSFG bolts (except eccentric load and prying forces)
	4 <sup>th</sup>	Efficiency of a joint .Welded Connections: Advantages and Disadvantages of welded connection
3 <sup>rd</sup>	1 <sup>st</sup>	Types of welded joints and specifications for welding.
	2 <sup>nd</sup>	Design stresses in welds
	3 <sup>rd</sup>	Strength of welded joints. Reduction of design stresses for long joints
	4 <sup>th</sup>	03.Design of Steel tension Members
4 <sup>th</sup>	1 <sup>st</sup>	Common shapes of tension members.
	2 <sup>nd</sup>	Design strength of tension members



5 <sup>th</sup>	3 <sup>rd</sup>	yielding of gross cross section, rupture of critical section
	4 <sup>th</sup>	the concept of block shear
	1 <sup>st</sup>	Maximum values of effective slenderness ratio
	2 <sup>nd</sup>	Analysis of tension members
6 <sup>th</sup>	3 <sup>rd</sup>	Design of tension members
	4 <sup>th</sup>	04.Design of Steel Compression members
	1 <sup>st</sup>	Common shapes of compression members
	2	Bulking class of cross sections. slenderness ratio
7 <sup>th</sup>	3	Design compressive stress
	4 <sup>th</sup>	strength of compression members.
	1 <sup>st</sup>	Analysis of compression members
	2 <sup>nd</sup>	Design of compression members (axial load only). Analysis
8 <sup>th</sup>	3 <sup>rd</sup>	5.0 Steel Column bases and foundations
	4 <sup>th</sup>	Types of column bases ,their suitability
	1 <sup>st</sup>	Design of slab base
	2	Design of slab base (subjected to axial loading) with concrete footing
9 <sup>th</sup>	3 <sup>rd</sup>	Design of gusseted base
	4 <sup>th</sup>	Design of gusseted base subjected to axial loading Design of gusseted base with concrete footing
	1 <sup>st</sup>	6.0 Design of Steel beams
	2 <sup>nd</sup>	Common cross sections
10 <sup>th</sup>	3 <sup>rd</sup>	their classification
	4 <sup>th</sup>	Plastic moment capacity of sections, moment capacity and shear resistance.
	1 <sup>st</sup>	Deflection limits, web buckling and web crippling.
	2 <sup>nd</sup>	Design of laterally supported beams against bending and shear.
11 <sup>th</sup>	3 <sup>rd</sup>	Types of built up sections
	4 <sup>th</sup>	design of simple built up sections using flange plates with I-sections or web plates.
	1 <sup>st</sup>	.7.0 Design of Tubular Steel structures
		Tube columns and compression members, crinkling Round tubular sections, permissible stresses

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	2 <sup>nd</sup>	Tube tension members and tubular roof trusses.
	3 <sup>rd</sup>	Joints in tubular trusses Design of tubular beams and purlins
	4 <sup>th</sup>	8.0 Design of Timber Structures Types of timber
12 <sup>th</sup>	1 <sup>st</sup>	Types of grading of timber
	2 <sup>nd</sup>	Types of defects,
	3 <sup>rd</sup>	Types of permissible stresses .
	4 <sup>th</sup>	. Design of axially loaded timber columns solid, box
13 <sup>th</sup>	1 <sup>st</sup>	built up section except spaced columns
	2 <sup>nd</sup>	Design of simple timber structural elements in flexure Solid sections & flitched beams
	3 <sup>rd</sup>	form factor and moment of resistance of built-up sections
	4 <sup>th</sup>	check for shear, bearing and deflection
14 <sup>th</sup>	1 <sup>st</sup>	9.0 Design of Masonry Structures Design consideration for masonry walls
	2 <sup>nd</sup>	, Load bearing walls -Permissible stresses Slenderness ratio, Effective length, Effective height
	3 <sup>rd</sup>	Effective thickness, Eccentricity of loads, Grade of mortar
	4 <sup>th</sup>	Non-Load bearing walls – Panel walls, Curtain walls, Partition walls. . Design consideration for masonry columns, piers and buttresses
15 <sup>th</sup>	1 <sup>st</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
	2 <sup>nd</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
	3 <sup>rd</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
	4 <sup>th</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
16 <sup>th</sup>	1 <sup>st</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
	2 <sup>nd</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
	3 <sup>rd</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
	4 <sup>th</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
17 <sup>th</sup>	1 <sup>st</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
	2 <sup>nd</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
	3 <sup>rd</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
	4 <sup>th</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
18 <sup>th</sup>	1 <sup>st</sup>	PREVIOUS YEAR QUESTIONS PRACTICE
	2 <sup>nd</sup>	PREVIOUS YEAR QUESTIONS PRACTICE

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