## INSTITUTE OF ENGINEERING AND MANAGEMENT GOURAHARI VIHAR, PO: RANIPUT, JEYPORE – 764 005

## **LESSON PLAN**

Name of the Subject: Stuructural Design-II				
Name of the Faculty: Pabani Patra				
Semester: Fifth Semester Branch: Civil Engineering				
Semester F	<b>rom</b> : July to De	cember No. of Weeks: 15 Weeks		
Week	Class Dav	Theory/ Practical Topics		
	1 <sup>st</sup>	1.0 Introduction: Common steel structures, Advantages & disadvantages of		
$1^{st}$		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>	2.0Structural Steel Fasteners and Connections		
		Classification of boils, advantages and disadvantages of boiled 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 shears capacity of HSFG bolts. Analysis & design of Joints using bearing type and HSFG bolts (except eccentric load and prying forces)		
	$4^{th}$	Efficiency of a joint, Welded Connections: Advantages and Disadvantages of welded connection		
3 <sup>rd</sup>	$1^{st}$	Types of welded joints and specifications for welding.		
	$2^{nd}$	Design stresses in welds		
	$3^{rd}$	Strength of welded joints. Reduction of design stresses for long joints		
	$4^{\text{th}}$	03.Design of Steel tension Members		
	$1^{st}$	Common shapes of tension members.		
	$2^{nd}$	Design strength of tension members		
$4^{\text{th}}$	$3^{\rm rd}$	Yielding of gross cross section, rupture of critical section		
	$4^{\text{th}}$	The concept of block shear		
	$1^{st}$	Maximum values of effective slenderness ratio		
$5^{\text{th}}$	$2^{nd}$	Analysis of tension members		
	$3^{\rm rd}$	Design of tension members		
	$4^{\text{th}}$	04.Design of Steel Compression members		
6 <sup>th</sup>	1 <sup>st</sup>	Common shapes of compression members		
	2 <sup>nd</sup>	Bulking class of cross sections.		
	$3^{\rm rd}$	Slenderness ratio		
	$4^{\text{th}}$	Design compressive stress		

$7^{\text{th}}$	1 <sup>st</sup>	Strength of compression members.
	2 <sup>nd</sup>	Analysis of compression members
	3 <sup>rd</sup>	Design of compression members (axial load only)
		Analysis
	4 <sup>th</sup>	5.0Steel Column bases and foundations
8 <sup>th</sup>	1 <sup>st</sup>	Types of column bases their suitability
0	2 <sup>nd</sup>	Design of slab base
	2	Design of slab base (subjected to axial loading) with concrete footing
	3 <sup>rd</sup>	Design of gusseted hase
	4 <sup>th</sup>	Design of gusseted base subjected to axial loading
		Design of gusseted base with concrete footing
9 <sup>th</sup>	1 <sup>st</sup>	6.0Design of Steel beams
		Common cross sections
	$2^{nd}$	Their classification
	3 <sup>rd</sup>	Plastic moment capacity of sections, moment capacity and shear resistance.
	$4^{\text{th}}$	Deflection limits, web buckling and web crippling.
10 <sup>th</sup>	1 <sup>st</sup>	Design of laterally supported beams against bending and shear.
	2 <sup>nd</sup>	Types of built up sections
	3 <sup>rd</sup>	Design of simple built up sections using flange plates with I-sections or web
		plates.
	$4^{\text{th}}$	7.0 Design of Tubular Steel structures
11 <sup>th</sup>	1 <sup>st</sup>	Tube columns and compression members, crinkling
		Round tubular sections, permissible stresses
	2 <sup>nd</sup>	Tube tension members and tubular roof trusses.
	$3^{rd}$	Joints in tubular trusses
	4	Design of tubular beams and purlins
	$4^{tn}$	8.0Design of Timber Structures
th	. et	Types of timber
12 <sup>m</sup>	1 <sup>st</sup>	Types of grading of timber
	$2^{nd}$	
		Types of defects,
	3 <sup>rd</sup>	Types of permissible stresses
	$4^{\text{th}}$	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 (Design of Masonry Structures
	1	Design consideration for masonry walls
	2 <sup>nd</sup>	Load bearing walls -Permissible stresses Slenderness ratio. Effective length.
		Effective height
	ard	Effective this have Beend it is find to find
	5 <sup>rd</sup>	Effective thickness, Eccentricity of loads, Grade of mortar
	4 <sup>44</sup>	Non-Load bearing walls – Panel walls, Curtain walls, Partition walls.
teth	_ et	Design consideration for masonry columns, piers and buttresses
15"	1.	REVISION