

GOVERNMENT POLYTECHNIC, BALANGIR

DEPARTMENT OF CIVIL ENGINEERING

LESSION PLAN

SESSION 2023-24

SUBJECT: Structural Design-II	BRANCH: CIVIL ENGINEERING
NAME OF THE FACULTY: SOURAV KUMAR BEHERA & YASHOBANTA NAIK	SEMESTER: 5th

SL NO.	CHAPTER	HOURS	LECTURE NO.	TOPIC TO BE COVERED
1	CHAPTER 01	05		Introduction
			1	Common steel structures, Advantages & disadvantages of steel structures.
			2	Types of steel, properties of structural steel. Rolled steel sections, special considerations in steel design
			3	Loads and load combinations.
			4	Structural analysis and design philosophy
			5	Brief review of Principles of Limit State design
2	CHAPTER 02	10		Structural Steel Fasteners and Connections.
			1	Bolted Connections, Classification of bolts, advantages and disadvantages of bolted connections.
			2	Different terminology, spacing and edge distance of bolt holes.
			3	Types of bolted connections. Types of action of fasteners, assumptions and principles of design.
			4	Strength of plates in a joint, strength of bearing type bolts (shear capacity& bearing capacity), reduction factors, and shear capacity of HSFG bolts.
			5	Analysis & design of Joints using bearing type and HSFG bolts (except eccentric load and prying forces)
			6	Efficiency of a joint.
			7	Welded Connections: Advantages and Disadvantages of welded connection.
			8	Types of welded joints and specifications for welding.
			9	Design stresses in welds.
			10	Strength of welded joints.
3	CHAPTER 03	10		Design of Steel tension Members
			1	Common shapes of tension members.
			2	Design strength of a tension member

			3	Analysis of tension members. (Considering strength only and concept of block shear failure.)
			4	Analysis of tension members. (Considering strength only and concept of block shear failure.)
			5	Numerical Problem Practice
			6	Numerical Problem Practice OF Unequal angle
			7	Maximum values of effective slenderness ratio.
			8	Design of tension members. (Considering strength only and concept of block shear failure.)
			9	Design of tension members. (Considering strength only and concept of block shear failure.)
			10	Numerical Problem Practice.
4	CHAPTER 04	10		Design of Steel Compression members.
			1	Common shapes of compression members.
			2	Buckling class of cross sections as per IS 800
			3	Buckling class of cross sections as per IS 800
			4	Slenderness ratio
			5	Design compressive stress and strength of compression members.
			6	Numerical Problem Practice
			7	Table for Design Stress as per IS 800
			8	Analysis and Design of compression members (axial load only).
			9	Analysis and Design of compression members (axial load only).
			10	Numerical Problem Practice
5	CHAPTER 05	10		Design of Steel beams:
			1	Plastic moment capacity of a section.
			2	Common cross sections and their classification
			3	Limiting width to thickness ratio as per IS 800
			4	Bending strength of a laterally supported beam
			5	Shear strength of a laterally supported beam
			6	Deflection limits
			7	Web buckling

			8	Web crippling
			9	Numerical Problem Practice
			10	Numerical Problem Practice
6	CHAPTER 06	06		Design of Tubular Steel Structures
			1	Round Tubular Sections
			2	Permissible Stresses
			3	Permissible Stresses
			4	Tubular Compression Members
			5	Tubular Tension Members
			6	Joints in Tubular trusses.
7	CHAPTER 07	09		Design of Masonry Structures
			1	Design considerations for Masonry walls
			2	Design considerations for Masonry Columns
			3	Load Bearing walls
			4	Non-Load Bearing walls
			5	Permissible stresses
			6	Permissible stresses
			7	Slenderness Ratio
			8	Effective Length, Height & Thickness.
			9	Effective Length, Height & Thickness.