GOVT. POLYTECHNIIC KORAPUT

ACADEMIC SESSION 2020-2021

SEMESTER- 5th

BRANCH - CIVIL ENGINEERING

SUBJECT – STRUCTURAL DESIGN II

FACULTY NAME – RABINARAYAN HOTA

Period	Module / Number	Topic to be covered
1	**UNIT-1**	**Introduction:**Common steel structures, Advantages & disadvantages of steel structures,Types of steel, properties ofstructural steel.
2		Different types of Rolled steel sections, special considerations in steel design, Loads and load combinations in design of steel structure
3		Structural analysis and design philosophy of steel structure, Brief review of Principles of Limit State design.
	UNIT-2	**Structural Steel Fasteners and Connections.**
4		**Bolted Connections:** Classification of bolts(bearing bolt, high strength bolt), advantages and disadvantages of bolted connections,
5		Different terminology, spacing and edge distance of bolt holes & codal provisions related to bolted connection
6		Types of bolted connections, Types of action of fasteners, assumptions and principles of design for bolted connection.
7		Strength of plates in a joint, strength of bearing type bolts (shear capacity& bearing capacity),
8		reduction factors, types of HSFG bolt & shear capacity of HSFG bolts.
9		Analysis of Joints using bearing type bolt (except eccentric load and prying forces)
10		Design of joint using bearing type bolt
11		Analysis of joint using HSFG bolt
12		Design of joint using HSFG bolt, Efficiency of joint in bolted connection
13		OMR Test
14		**Welded Connections:** Advantages and Disadvantages of welded connection,Types of welded joints
15		specifications for welding(codal provisions)
16		Design stresses in welds,
17		Strength of welded joints, Reduction of design stresses for long joints in welded connection
	UNIT-3	**Design of Steel tension Members**
18		**:** Common shapes of tension members,Design strength of tension members,
19		yielding of gross cross section, rupture of critical section
20		OMR Test
21		concept of block shear, Maximum values of effective slenderness ratio
22		Analysis of tension members
23		Numericals on analysis of tension member
24		Design of tension member
	UNIT-4	**Design of Steel Compression members:**
25		Common shapes of compression members, Buckling class of cross sections
26		slenderness ratio, Design compressive stress, strength of compression members.
27		Analysis of compression members (axial load only).

28		Numericals on analysis of compression member,Design of compression member
29		Discussion for internal exam

30		Internal Exam
	UNIT-5	**Steel Column bases and foundations:**
31		Types of column bases and their suitability,Design of slab base (subjected to axial loading) with concrete footing.
32		Design of gusseted base (subjected to axial loading) with concrete footing.
	UNIT-6	**Design of Steel beams:**
33		Common cross sections of steel beam and their classification.
34		Plastic moment capacity of sections, moment capacity and shear resistance.
35		Deflection limits, web buckling and web crippling , Design of laterally supported beams against bending & shear
36		Discussion on internal exam questions& distribution of evaluated answer sheet
37		OMR Tet
38		Types of built up sections and design of simple built up sections using flange plates with I-sections .
39		design of simple built up sections using web plates with I-sections .
	UNIT-7	**Design of Tubular Steel structures:**
40		Round tubular sections, permissible stresses in tubular structure.
41		Tube columns and compression members, crinkling.
42		Tube tension members (analysis & design)
43		Tubular roof trusses. (analysis & design), Joints in tubular trusses
44		OMR Test
45		Design of tubular beams & purlins
46		Discussion on units learned
	UNIT-8	**Design of Timber Structures:**
47		Types of timber, grading of timber, defects occurring in timber, permissible stresses.
48		Design of axially loaded timber columns (solid section).
49		Design of axially loaded timber columns (box section).
50		Design of axially loaded timber columns (built up section).
51		Design of simple timber structural elements in flexure (Solid sections)
52		Design of simple timber structural elements in flexure (flitched beam)
53		form factor and moment of resistance of built-up sections, check for shear & check for bearing
54		OMR Test
55		Numericals related to moment of resistance of built-up sections with check for deflection).
	UNIT-9	**Design of Masonry Structures:**
56		Design considerations for masonry walls, Load bearing walls - Permissible stresses, Slenderness ratio,
57		Effective length, Effective height & Effective thickness of masonary wall, Eccentricity of loads, Grade of mortar
58		Non-Load bearing walls – Panel walls, Curtain walls, Partition walls.
59		Design considerations for masonry columns, piers and buttresses ,Design considerations for masonry wall footings.
60		Revision