COURSE TITLE : STRUCTURAL DESIGN - II
COURSE CODE : 6013
COURSE CATEGORY : A
PERIODS/WEEK : 4
PERIODS/SEMESTER: 60
CREDITS : 4

TIME SCHEDULE

Module	Topics	Period
1	Introduction to steel structures bolted & welded connections	15
2	Design of tension & compression members	15
3	Design of beams Plate girder	15
4	Design of truss Design of masonry wall	15
TOTAL		**60**

COURSE OUTCOME

Sl.	Sub	Student will be able to
1	1	Know the concept of design of steel structures
	2	Design steel structures as per Is 800 ,IS 875 & steel table
	3	Design masonry wall by structural analysis method using IS 1905- 1987

SPECIFIC OUTCOME

Upon completion of the course the student should be able to:

MODULE - I

1.1.0 Understand Steel structures.

1.1.1 List the advantages and disadvantages of steel structures over RCC structures.
1.1.2 Explain the properties of structural steel.
1.1.3 Explain method of analysis & design philosophy.
1.1.4 List the method of connections of steel members.
1.1.5 Calculate the strength of members using Bolted and welded connection.
1.1.6 Design welded connection

MODULE - II

2.1.0 Analyse tension and compression members

2.1.1 Calculate Net Area of tension members
2.1.2 Calculate the strength of tension member
2.1.3 Design of tension members as per BIS and steel table (single and double angles, Channels, sections)
2.1.4 Explain the use of Lug angles
2.1.5Calculate effective length and slenderness ratio of column for different end conditions
2.1.6 Design compression members- single and double angle strut-continuous and Discontinuous struts as per BIS and steel table
2.1.7 Design of columns-rolled steel sections with and without cover plate
2.1.8 Describe Lacings (single and double) and Battens

MODULE - III

3.1.0 Analyse steel beams as per BIS and steel tables

3.1.1Know the plastic moment carrying capacity of section
3.1.2 Identify the classification of sections
3.1.3 Differentiate laterally supported and unsupported beams
3.1.4 Calculate Bending strength, Shearing strength, Bearing strength and deflection limit
3.1.5 Design of simply supported – laterally supported beams
3.1.6 Explain the different parts of a plate girder and the function of each part with neat sketch

MODULE - IV

4.1.0 Analyze roof truss

4.1.1 List the loads acting on a truss
4.1.2 Illustrate the different types & components and their functions of the truss elements
4.1.3 Calculate loads acting on a roof truss
4.1.4 Calculate wind pressure from given wind speed and coefficients
4.1.4 Design angle purlin

4.2.0 Analyze masonry wall

4.2.1 List design considerations of masonry wall
4.2.2 Calculate effective height, effective length and effective thickness of masonry wall
4.2.3 Design masonry wall by structural analysis method

CONTENT DETAILS

MODULE–I

Design of Steel Structures:-Introduction to steel Design-Use of IS: 800:2007,steel tables– Advantages and disadvantages- properties of structural steel- Method of analysis & design philosophy- Methods of connections of steel members- Strength of bolted and Welded connections-Design of members using welded connection only.

MODULE–II

Design of Tension members:- General -Net sectional Area of Tension members-Effective sectional area of angles / T-sections connected by one leg /flange (welded Connections only) - Design of ties using Single/Double angles, T-Sections and channels –Lug angles.
Design of Compression members: – General - effective length –slenderness ratio reference to IS Code – Discontinuous single/double angle struts – continuous single angle struts -Design of columns using rolled steel sections with/without cover plates –Lacing and battens–requirements–Description only–(Design of Lacing or battens not necessary)

MODULE – III

Design of Steel beams:- Plastic moment carrying capacity of section–Classification of cross section-Bending strength, shearing strength and deflection limit of laterally supported beam. (Symmetrical Cross sections only)-Fundamentals of Plate Girder-Parts and function.

MODULE- IV

Design of roof truss: -Loads acting on a truss – types of roof truss – components – functions - Design of Elements of roof truss –calculate wind load - calculation of wind pressure from given basic wind speed and coefficients. Design of angle purlins with given wind load
Design of masonry wall: -Design consideration of masonry walls – effective height – effective thickness – effective length – slenderness ratio – eccentricity – design of masonry wall by structural analysis method.

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REFERENCES

1. IS: 800-2007- code of practice for steel structures
2. Steel Tables
3. N Subramanian : Steel structures ; Oxford Press
4. K.S. Sai Ram : Design of Steel structures ; Pearson Publication
5. S S Bhavikatti : Design of Steel Structures ; I K International Publishers.
6. Sarwar Alam Raz : Structural Design in Steel ; New Age International Publishers
7. Duggal : Limit state Design of steel structures ; Mc Graw Hill