

Department of Civil Engineering

COURSE MODULES OF THE COURSE TAUGHT FOR THE ODD SESSION AUG-JAN 2025-26

| Course Syllabi with CO's | | | | Academic Year: 2025-2026 | | | | | | | | | | |
|---|---|---------------|--------------|--------------------------|----------|----------|-----------|--|--|--|--|--|--|--|
| Faculty Member: Dr. Pujitha Ganapathi C. | | | | | | | | | | | | | | |
| Department: Civil Engineering | | | | | | | | | | | | | | |
| Course Code | Course Title | Core/Elective | Prerequisite | Contact Hours | | | Total Hrs | | | | | | | |
| | | | | L | T | P | | | | | | | | |
| BCV701 | Design of Steel Structural Elements | Core | Nil | 3 | - | 2 | 40 | | | | | | | |
| Objectives | 1. To understand the behaviour of structural elements in steel structures and well versed with Steel design principles according to the guidelines of IS: 800-2007. 2. To apply their knowledge of Structural mechanics to analyse and design the steel structures. 3. To design the steel structural elements of different forms and connections under different stresses. | | | | | | | | | | | | | |
| Topics Covered as per Syllabus | | | | | | | | | | | | | | |
| Module-1 | | | | | | | | | | | | | | |
| Introduction: Advantages and Disadvantages of Steel Structures, Limit state method Limit State of Strength, Structural Stability, Serviceability Limit states, Failure Criteria of steel, Design Consideration, Loading and load combinations, IS code provisions, Specification and Section classification. | | | | | | | | | | | | | | |
| Plastic Behaviour of Structural Steel: Introduction, Plastic theory, Plastic Hinge Concept, Plastic collapse load, load factor, Shape factor, Theorem of plastic collapse, Methods of Plastic analysis. | | | | | | | | | | | | | | |
| 08 Hours | | | | | | | | | | | | | | |
| Module-2 | | | | | | | | | | | | | | |
| Bolted Connections: Introduction, Types of Bolts, Behaviour of bolted joints, Design of High Strength friction Grip (HSFG) bolts, Design of Simple bolted Connections (Lap and Butt joints) and bracket connections both types. | | | | | | | | | | | | | | |
| 08 Hours | | | | | | | | | | | | | | |
| Module-3 | | | | | | | | | | | | | | |
| Welded Connections: Introduction, Types and properties of welds, Effective areas of welds, Weld Defects, Simple welded joints for truss member and Bracket connections both types. Advantages and Disadvantages of Bolted and Welded Connections. | | | | | | | | | | | | | | |
| 08 Hours | | | | | | | | | | | | | | |
| Module-4 | | | | | | | | | | | | | | |
| Design of Tension Members: Introduction, Types of Tension members, Slenderness ratio, Modes of Failure, Factors affecting the strength of tension members, Design of Tension members with Lug angles. | | | | | | | | | | | | | | |
| Design of Column Bases: Design of Simple Slab Base and Gusseted Base. | | | | | | | | | | | | | | |
| 08 Hours | | | | | | | | | | | | | | |
| Module-5 | | | | | | | | | | | | | | |
| Design of Compression Members: Introduction, Failure modes, Behaviour of compression members, Sections used for compression members, Effective length of compression members, Design of compression members and built-up Compression members, Design of Laced and Battened Systems. | | | | | | | | | | | | | | |
| 08 Hours | | | | | | | | | | | | | | |
| List of Textbooks | | | | | | | | | | | | | | |
| 1. N Subramanian, "Design of Steel Structures", Oxford University Press, New Delhi, India. 2. S K Duggal, "Limit State Design of Steel Structures" McGraw Hill Publications Chennai. | | | | | | | | | | | | | | |
| List of Reference Books | | | | | | | | | | | | | | |
| 1. Dayarathnam P, "Design of Steel Structures", S Chand and Company Ltd., New Delhi. | | | | | | | | | | | | | | |

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| 2. | Kazim S M A and Jindal R S, "Design of Steel Structures", Prentice Hall of India, New Delhi. |
| 3. | IS 800-2007: General Construction in Steel Code Practice (Third revision), Bureau of Indian Standards, New Delhi. |

List of URLs, Textbooks, Notes, Multimedia Content, etc

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| 1. | https://nptel.ac.in/courses/105105162 |
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Graduate Attributes (As per NBA)

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| Course Outcomes | At the end of the course the student will be able to: CO1: Explain: the engineering properties and the behaviour of steel structural elements according to the guidelines. L2 CO2: Analyse and design: Structural connection of Steel Elements. L4 & L5 CO3: Analyse and design: the steel structural elements of different forms under different stresses. L4 & L5 |
| Internal Assessment Marks: 30 + 10 (3 Session Tests are conducted during the semester and marks allotted based on average of 3 test and assignment performances). | |

The Correlation of Course Outcomes (CO's) and PO's and PSOs

| Course Code: | BCV701 | Title: Design of Steel Structural Elements | | | | | | | | | | Faculty Member: Dr. Pujitha Ganapathi C. | | |
|-----------------|------------------|--|-----|-----|-----|-----|-----|-----|-----|------|------|--|------|------|
| Course Outcomes | Program Outcomes | | | | | | | | | | | | PSOs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO-1 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 3 | 1 |
| CO-2 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| CO-3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 | 2 |

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution '-' = No Contribution