

| No | Information on Every Subject | |
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| 1. | Unit Name: Design of Steel Structures I | |
| 2. | Unit Code: CE-51024 | |
| 3. | Classification : Engineering Subject | |
| 4. | Credit Hours : 2.5 | |
| | 2for lecture: (2 hours ×15 weeks) | |
| 5. | Semester/ Year Offered: 1/5 | |
| 6. | Pre-requisite (if any): CE-11022, CE-12022, CE-31013, CE-32013 | |
| 7. | Mode of Delivery : Lecture and Tutorial | |
| 8. | Assessment System and Breakdown of Marks: | |
| | Assignment/Tutorial | 30% |
| | Final examination | 70% |
| | Total | 100% |
| 9. | Academic Staff Teaching Unit: | |
| 10. | Objective of Unit: The objective of this course is <ul style="list-style-type: none"> - to apply and design the structural members of steel structures for civil engineering fields. | |
| 11. | Learning Outcome of Unit: On completion of this unit, students shall be able to: <ol style="list-style-type: none"> 1. understand the types of structural steel members, AISC - LRFD design procedure and Specification , Building Codes, material properties and behavior 2. design tension members for steel structures under applied loadings such as top chords, bottom chords of a truss and sag rods and tension rods 3. design the connection types for steel structures such as bolted connections and welded connections 4. design structural members for steel frame structures such as columns and beams under applied loadings | |
| 12. | Synopsis of Unit: Introduction, Steel and Properties, Tension Member, Structural Fasteners, Welding, Compression Members, Columns, Laterally Supported Beams | |
| 13. | Topics: <ol style="list-style-type: none"> 1. Introduction <ul style="list-style-type: none"> • Loading on steel structures • Types of structural steel members • Specification and Building Codes • Philosophies of Design 2. Steel and Properties <ul style="list-style-type: none"> • Structural and fattener steels • Weld electrode and fillet material • Stress strain behavior • Material toughness and yield strength | |

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| | <p>3. Tension Members</p> <ul style="list-style-type: none"> • Nominal strength • Net Area, Effective net area • Tearing Failure at bolt holes • Design of Tension members • Tension rods <p>4. Structural Fasteners</p> <ul style="list-style-type: none"> • Nominal strength of individual fasteners • LRFD-fasteners • Tension Member –Bearing Type connection joint • Eccentric shear • Fastener acting in Axial Tension • Combined Shear and Tension • Shear and Tension from Eccentric Loading <p>5. Welding</p> <ul style="list-style-type: none"> • Welding processes • Types of joints and welds • Size, length limitation for fillet weld • Plug and slot weld • Effective strength of weld • Nominal strength of weld • LRFD welds <p>6. Compression Members, Columns</p> <ul style="list-style-type: none"> • Basic column strength • Effective length • LRFD Design for Rolled Shaped subject to axial compression <p>7. Laterally Supported Beams</p> <ul style="list-style-type: none"> • Simple bending of symmetrical shapes • Behavior of laterally stable beams • Laterally supported beams, LRFD design • Serviceability of beams • Shear on rolled beams • Concentrate loads applied to rolled beams |
| 14. | <p>Main References:</p> <p>Steel Structures, Design and Behavior Emphasizing Load and Resistance Factor Design, Fourth Edition by Charles G Salmon, John E. Johnson</p> |
| 15. | <p>Additional References:</p> <p>Structural Steel Design by U NyiHlaNgwe</p> |