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| Image result for nit meghalaya logo | **National Institute of Technology Meghalaya**An Institute of National Importance | **CURRICULUM** |
| Programme | **Bachelor of Technology** | Year of Regulation | **2019-20** |
| Department | **Civil Engineering** | Semester | **VII** |
| CourseCode | Course Name | **Pre requisite** | Credit Structure | Marks Distribution |
| L | T | P | C | INT | MID | END | Total |
| **CE417** | **Design of Steel Structures** | **Nil** | **3** | **0** | **0** | **3** | **50** | **50** | **100** | **200** |
| CourseObjectives | 1. To introduce steel structures and its basic components
 | Course Outcomes | CO1 | Learning of basic elements of a steel structure  |
| 1. To introduce structural steel fasteners like welding and bolting
 | CO2 | Learning about the fundamentals of structural steel fasteners  |
| 1. To design tension members, compression members, beams and beam-columns
 | CO3 | Ability to design basic elements of steel structure like tension members, compression members, beams and beam-columns  |
| 1. To design column splices and bases
 | CO4 | Ability to design column splices and bases. |
|  | CO5 |  |
|  | CO6 |  |
| No. | COs | Mapping with Program Outcomes (POs) | Mapping with PSOs |
| PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| 1 | CO1 | **3** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| 2 | CO2 | **3** | **3** | **0** | **0** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** |
| 3 | CO3 | **3** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** | **0** | **3** |
| 4 | CO4 | **3** | **3** | **3** | **0** | **0** | **0** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** |
| 5 | CO5 | **3** | **3** | **3** | **0** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** | **3** |
| 6 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SYLLABUS |
| No. | Content | Hours | COs |
| I | **Introduction**Types of Structural Steel, Mechanical Properties of Steel, Types of Structural Steel, Mechanical Properties of Steel, Cold Work and Strain Hardening, Advantages of Steel as a Structural Materials, Types of Steel Structures, Codes and Specifications. | 02 | CO1 |
| II | **Design Approach**Factor of Safety, Permissible and Working Stresses, Elastic Method, Plastic Method, Introduction to Limit States of Design | 02 | CO1,CO2 |
| III | **Connections**Type of Connections, Riveted, Bolted and Welded Connections, Strength, Efficiency and Design of Joints, Modes of Failure of a Riveted Joint, Advantages and Disadvantages of Welded Joints, Design of Fillet and Butt Welds, Design of Eccentric Connections. | 06 | CO3, CO4 |
| IV | **Tension Members**Net Sectional Area, Permissible Stress, Design of Axially Loaded Tension Member, Design of Member Subjected to Axial Tension and Bending. | 06 | CO3, CO4 |
| V | **Compression Members**Modes of Failure of a Column, Buckling Failure:Euler’sTheory,EffectiveLength, Slenderness Ratio,Design Formula: I.S. Code Formula, Design of Compression Members, Design of Built-Up Compression Members: Laced and Battened Columns. | 06 | CO3, CO4 |
| VI | **Beams**Design Procedure, Built-Up Sections, Plate Thickness, Web Crippling, Web Buckling, Connections nd Curtailment of Flange Plates | 06 | CO3, CO4 |
| VII | **Beam-Column**Eccentricity of Load, Interaction Formulae, Design Procedure, Eccentrically Loaded Base Plates. | 04 | CO3, CO4 |
| VIII | **Column Base**Design of base plates, load transfer mechanism, design of slab base, gusseted base and anchorage | 04 | CO3, CO4 |
| Total Hours | **36** |  |
| **Essential Readings** |
| 1. Subramanian, N.,“Design of Steel Structures”, Oxford University Press
 |
| 1. Negi, L. S., “Design of Steel Structures”, Tata McGraw Hill.
 |
| 1. M.R.Shiyekar Limit state design of steel structures, PHI Learning,2010.
 |
| **Supplementary Readings** |
| 1. Raz, S. A., “Structural Design in Steel”, New Age International Publisher.
 |
| 1. Edwin, M., Gaylord, J., and Stallmeyer, J. E., “Design of Steel Structures”, McGraw-Hill
 |
| 1. Dayaratnam, P., “Design of Steel Structures”, Chand S. & Co..
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