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|  | | | | **National Institute of Technology Meghalaya**  An Institute of National Importance | | | | | | | | | | | | | | | | | | | | **CURRICULUM** | | | | |
| Programme | | | | **Bachelor of Technology in Civil Engineering** | | | | | | | | | | | | | Year of Regulation | | | | | | | **2020** | | | | |
| Department | | | | **Civil Engineering** | | | | | | | | | | | | | Semester | | | | | | | **IV** | | | | |
| Course Code | | Course Name | | | | | | | | **Pre-Requisite** | | | | Credit Structure | | | | | | Marks Distribution | | | | | | | | |
| **CE 256** | | **STRUCTURAL ANALYSIS -I LAB** | | | | | | | | **NIl** | | | | L | | T | | P | C | Continuous Assessment | | | | | | | Total | |
| **0** | | **0** | | **2** | **1** | **01 Experiment** | | | | **10** | | | **100** | |
| Course Objective | | **I)** To use the concept of structural analysis and thus to solve different critical analytical problems in the civil engineering field. | | | | | | | | | | Course Outcomes | | | | CO1 | | Able to use the concept of structural analysis and thus to solve different critical analytical problems in the civil engineering field. | | | | | | | | | | |
| **II)** To analyze statically determinate trusses, beams, and frames and obtain internal loading. | | | | | | | | | | CO2 | | Able to analyze statically determinate trusses, beams, and frames and obtain internal loading. | | | | | | | | | | |
| **III)** To obtain the influence lines for statically determinate and indeterminatestructures. | | | | | | | | | | CO3 | | Able to obtain the influence lines for statically determinate and indeterminatestructures. | | | | | | | | | | |
| **IV)** To determine the deflections of beams and frames using classical methods. | | | | | | | | | | CO4 | | Able to determine the deflections of beams and frames using classical methods. | | | | | | | | | | |
| V) To get familiar with professional and ethical issues and the importance of lifelong learning in structural engineering. | | | | | | | | | | CO5 | | Able to get familiar with professional and ethical issues and the importance of lifelong learning in structural engineering. | | | | | | | | | | |
| 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** | **3** | **3** | **3** | **0** | | **0** | | **0** | | **2** | | | **1** | **0** | | **0** | | **1** | | **1** | | | **1** |
| 2 | CO2 | | **3** | | **3** | **3** | **3** | **3** | **0** | | **0** | | **0** | | **2** | | | **1** | **0** | | **0** | | **1** | | **1** | | | **1** |
| 3 | CO3 | | **3** | | **3** | **3** | **3** | **3** | **0** | | **0** | | **0** | | **2** | | | **1** | **0** | | **0** | | **1** | | **1** | | | **1** |
| 4 | CO4 | | **3** | | **3** | **3** | **3** | **3** | **0** | | **0** | | **0** | | **2** | | | **1** | **0** | | **0** | | **1** | | **1** | | | **1** |
| 5 | CO5 | | **1** | | **1** | **0** | **0** | **2** | **2** | | **2** | | **3** | | **2** | | | **0** | **0** | | **3** | | **1** | | **1** | | | **1** |
| SYLLABUS | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. | Content | | | | | | | | | | | | | | | | | | | | | Hours | | | | COs | | |
| 1 | To experiment and verify the basic theory of bending moments and shear forces in a beam. | | | | | | | | | | | | | | | | | | | | | **01** | | | | **CO1 CO2 CO3 CO4 CO5** | | |
| 2 | To study of beam deflection under different loads and fixing conditions. | | | | | | | | | | | | | | | | | | | | | **01** | | | |
| 3 | To study of torque and deflection in different materials with circular section. | | | | | | | | | | | | | | | | | | | | | **01** | | | |
| 4 | To study the unsymmetrical bending and shear center of different asymmetric sections. | | | | | | | | | | | | | | | | | | | | | **01** | | | |
| 5 | To study the strains, stresses, forces, and deflections in various pin-jointed frameworks. | | | | | | | | | | | | | | | | | | | | | **01** | | | |
| 6 | To study the characteristics of a three-pinned, two pinned, and fixed arch under various load conditions. | | | | | | | | | | | | | | | | | | | | | **01** | | | |
| 7 | To study buckling of slender columns and to find relationships between length, end-fixing conditions, and buckling load. | | | | | | | | | | | | | | | | | | | | | **01** | | | |
| 8 | To study the behavior of various indeterminate beams. | | | | | | | | | | | | | | | | | | | | | **01** | | | |
| 9 | To study the plastic bending of beams and portal frames. | | | | | | | | | | | | | | | | | | | | | **01** | | | |
| 10 | To study deflections and reactions, bending moments, and sway of rectangular portals. | | | | | | | | | | | | | | | | | | | | | **01** | | | |
| 11 | To study the characteristics of a simple suspension bridge. | | | | | | | | | | | | | | | | | | | | | **02** | | | |
| Total Hours | | | | | | | | | | | | | | | | | | | | | | **12** | | | |  | | |
| **Essential Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Hibbeler R.C., “Structural Analysis,” Pearson, 9th Edition, 2017 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. KassimaliA., “Structural Analysis,” Cengage. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Reddy C.S., “Basic Structural Analysis,” Tata McGraw Hill, 3rd Edition, 2011 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Supplementary Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Punmia B. C., “Theory of Structures” Laxmi Publication house, 16th Edition, 2017 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Ramamrutham S., “Theory of Structures,”Dhanpat Rai Publications, 9th Edition, 2014 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |