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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 in Civil Engineering** | | | | | | | | | | | | | Year of Regulation | | | | | | | | | | **2020** | | | | | |
| Department | | | | **Civil Engineering** | | | | | | | | | | | | | Semester | | | | | | | | | | **V** | | | | | |
| Course  Code | | Course Name | | | | | | | | **Pre requisite** | | | | Credit Structure | | | | | | | | Marks Distribution | | | | | | | | | | |
| L | | T | | | P | C | | INT | | | MID | | | END | | | Total | |
| **CE315** | | **Structural Analysis II** | | | | | | | | **Nil** | | | | **3** | | **0** | | | **0** | **3** | | **50** | | | **50** | | | **100** | | | **200** | |
| Course  Objectives | | **To acquire the knowledge to solve statically indeterminate structures by displacement methods** | | | | | | | | | | Course Outcomes | | | | CO1 | | | **Able to analyse framed structures using classical displacement methods** | | | | | | | | | | | | | |
| **To acquire the knowledge to approximately solve framed structures** | | | | | | | | | | CO2 | | | **Able to analyse framed structures using approximate methods of analysis** | | | | | | | | | | | | | |
| **To provide the basic framework of matrix methods of structural analysis** | | | | | | | | | | CO3 | | | **Able to analyse statically determinate and indeterminate structures using classical matrix methods such as stiffness and flexibility methods.** | | | | | | | | | | | | | |
| **To provide the basic concepts of plastic structural analysis in the understanding of different collapse mechanisms.** | | | | | | | | | | CO4 | | | **Able to understand the need and importance of computational structural analysis technique such as FEM.** | | | | | | | | | | | | | |
|  | | | | | | | | | | CO5 | | | **Able to understand the importance and application of plastic methods of structural analysis** | | | | | | | | | | | | | |
| 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** | **1** | **2** | **1** | | **1** | | **0** | | **1** | | | **1** | | | **1** | | **1** | | | **0** | | | **0** | | | **0** |
| 2 | CO2 | | **3** | | **3** | **0** | **1** | **2** | **1** | | **1** | | **0** | | **1** | | | **1** | | | **1** | | **1** | | | **0** | | | **0** | | | **0** |
| 3 | CO3 | | **3** | | **3** | **0** | **1** | **2** | **1** | | **1** | | **0** | | **1** | | | **1** | | | **1** | | **1** | | | **0** | | | **0** | | | **0** |
| 4 | CO4 | | **3** | | **3** | **0** | **0** | **0** | **1** | | **1** | | **0** | | **1** | | | **1** | | | **1** | | **1** | | | **0** | | | **0** | | | **0** |
| 5 | CO5 | | **3** | | **3** | **0** | **1** | **2** | **1** | | **1** | | **0** | | **1** | | | **1** | | | **1** | | **1** | | | **0** | | | **0** | | | **0** |
| SYLLABUS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. | Content | | | | | | | | | | | | | | | | | | | | | | | Hours | | | | | | COs | | |
| I | **Classical methods of analysis of framed Structures**  Slope deflection method, Moment distribution method, Kanis Method – application to analysis of indeterminate Beams and Building frames. | | | | | | | | | | | | | | | | | | | | | | | **07** | | | | | | **CO1** | | |
| II | **Analysis of Building Frame**  Approximate Method of Analysis of Building frame subjected to gravity loads and lateral loads, Portal Method and Cantilever method. | | | | | | | | | | | | | | | | | | | | | | | **05** | | | | | | **CO2** | | |
| III | **Matrix Methods of Structural Analysis**  **I**ntroduction to Matrix Methods-Flexibility Method and displacement method. Local and global stiffness matrices, assembly, band storage, solution of resulting simultaneous algebraic equation, boundary conditions, application to beam, plane and space truss, analysis of plane frame.Brief introduction to finite element method with its principles. | | | | | | | | | | | | | | | | | | | | | | | **14** | | | | | | **CO3, CO4** | | |
| IV | **Plastic Method of Structural Analysis**  Concept of Redistribution of internal forces. Shape factor, combined mechanism methods for Plastic Collapse Load of beams, plastic moment distribution, deflections at point of collapse. | | | | | | | | | | | | | | | | | | | | | | | **10** | | | | | | **CO5** | | |
| Total Hours | | | | | | | | | | | | | | | | | | | | | | | | **36** | | | | | |  | | |
| **Essential Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Weaver W. and Gere J. M., “Matrix analysis of framed structures”, CBS Publishers. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Wang C.K., “Intermediate Structural Analysis”, Tata McGraw Hill. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Kassimali A., “Structural Analysis”, Cengage. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Supplementary Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Reddy C.S., “Basic Structural Analysis”, Tata McGraw Hill. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Pandit G.S. and Gupta S.P. “Structural Analysis - A matrix approach”, Tata McGraw Hill. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Norris C.H. Wilbur J.B. Utku S., “Elementary Structural Analysis”, Tata McGraw Hill. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Kanchi, M.B., “Matrix Methods of Structural analysis”, Wiley Eastern Limited. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |