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|  | **National Institute of Technology Meghalaya**An Institute of National Importance | **CURRICULUM** |
| Programme | **Master of Technology (Structural Engineering)** | Year of Regulation | **2018** |
| Department | **Civil Engineering** | Semester | **I** |
| Course Code | Course Name | Pre-requisite | Credit Structure | Marks Distribution |
| L | T | P | C | INT | MID | END | Total |
| **CE 521** | **Computational Lab**  | **NIL** | **0** | **0** | **2** | **1** |  | **100** | **100** |
| Course Objectives | To develop the student’s knowledge on soling many problems in different mathematical subjects, especially in numerical analysis and other subjects which connected to computer oriented mathematics. | Course Outcomes | CO1 | Able to use Matrix methods for interactive computations. |
| CO2 | Familiar with memory and file management  |
| CO3 | Able to generate plots and export this for use in reports and presentations. |
| CO4 | Able to program scripts and functions using  |
| CO5 | Able to use basic flow controls (if-else, for, while). |
| CO6 | Familiar with strings and matrices and their use. |
| SYLLABUS |
| No. | Content | Hours | COs |
| I | Compute the flexibility and stiffness matrix for continuous beams, and pinned/rigidjointed structures | 2 | CO1 |
| II | Analysis of structures by direct and generalized flexibility method | 2 | CO2 |
| III | Analysis of structures by direct and generalized stiffness method | 2 | CO3 |
| IV | Write general computer programs for the analysis of • Plane pin-jointed structures• Continuous beams • Plane right-jointed framesAlso, validate the results using any standard Structural Analysis software. | 2 | CO4 |
| V | Write general computer programs for the analysis of • Space pin-jointed structures• Space right-jointed framesAlso, validate the results using any standard Structural Analysis software. | 2 | CO5 |
| VI | Analyze pin-jointed frame using stiffness method if there is a rise of temperature in all members | 1 | CO6 |
| VII | Analyze rigid-jointed frame using stiffness method by both ignoring and considering the axial deformation. | 1 | CO1 |
| Total Hours | 12 |  |
| **Essential Readings** |
| 1. Weaver, W. and Gere, J. M., “Matrix Analysis of Framed Structures”, Springer, 2nd edition 2004 |
| 2. Ghali, A., Neville, A. M., and Brown, T. G., “Structural Analysis – A Unified Classical and Matrix Approach”, CRCPress, 6th edition 2009. |
| **Supplementary Readings** |
| 1. Kassimali, A., Matrix Analysis of Structures, Cengage Learning, 2nd edition 2011. |
| 2. Menon, D., Advanced Structural Analysis, Alpha Science International, 2009. |