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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 525** | | **SOFT COMPUTING LAB -1** | | **NIL** | | **0** | **0** | **2** | **1** |  | | | **100** | | **100** |
| Course Objectives | | To develop the student’s knowledge on understanding programming to solve 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 Matlab for interactive computations. | | | | | | | |
| CO2 | Familiar with memory and file management in Matlab. | | | | | | | |
| CO3 | Able to generate plots and export this for use in reports and presentations. | | | | | | | |
| CO4 | Able to program scripts and functions using the Matlab development environment. | | | | | | | |
| 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 | Creating and working with arrays of numbers | | | | | | | | | | 1 | | | CO1 | |
| II | Creating and printing Simple 2DPlots | | | | | | | | | | 1 | | | CO2 | |
| III | Creating, saving, and executing a script file | | | | | | | | | | 1 | | | CO3 | |
| IV | Creating and executing a function file | | | | | | | | | | 1 | | | CO4 | |
| V | Manipulate matrices and use them as matrices or arrays | | | | | | | | | | 1 | | | CO5 | |
| VI | Create and work with anonymous functions | | | | | | | | | | 1 | | | CO6 | |
| VII | Work with symbolic mathematics toolbox | | | | | | | | | | 1 | | | CO1 | |
| VIII | Saving, loading, importing, and exporting data | | | | | | | | | | 1 | | | CO2 | |
| IX | Creating 2-D/3-D plots with animation effects | | | | | | | | | | 2 | | | CO3 | |
| X | Writing script/function file to execute problems on  *•* Linear Algebra  *•* Curve Fitting and Interpolation  *•* Data Analysis and Statistics  *•* Numerical Integration,  *•* Ordinary Differential Equations | | | | | | | | | | 2 | | | CO4 | |
| Total Hours | | | | | | | | | | | 12 | | |  | |
| **Essential Readings** | | | | | | | | | | | | | | | |
| 1. Hahn, B. D. and Valentine, D. T., “Essential MATLAB for scientists and engineers”, Elsevier, 5th edition 2013. | | | | | | | | | | | | | | | |
| 2. “MATLAB Student Version Releases”, The Math Works, Inc, 2015. | | | | | | | | | | | | | | | |
| **Supplementary Readings** | | | | | | | | | | | | | | | |
| 1. Moler, C., “Numerical Computing with MATLAB”, The Math Works, Inc, 2004. | | | | | | | | | | | | | | | |
| 2. Kiusalaas, J., “Numerical Methods in Engineering with MATLAB”, Cambridge University Press, 2nd edition 2009 | | | | | | | | | | | | | | | |