

MATLAB PROGRAMMING

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|--|------------------|---------------------------------|---------------|----------------------|--------|
| Course Code | 20EC2601A | Year | III | Semester | II |
| Course Category | Open Elective-II | Branch | Common to All | Course Type | Theory |
| Credits | 3 | L-T-P | 3-0-0 | Prerequisites | Nil |
| Continuous Internal Evaluation: | 30 | Semester End Evaluation: | 70 | Total Marks: | 100 |

| Course Outcomes | |
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| Upon successful completion of the course, the student will be able to | |
| CO1 | Outline the basic concepts of MATLAB. (L2) |
| CO2 | Develop programs for scientific and mathematical problems. (L3) |
| CO3 | Analyze an engineering system/Problem through graphical representation and numerical analysis. (L4) |
| CO4 | Build optimized code for various applications in Engineering and Technology.(L3) |

| Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix) | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|------|------|
| Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation | | | | | | | | | | | | | | |
| * - Average value indicates course correlation strength with mapped PO | | | | | | | | | | | | | | |
| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 | PSO1 | PSO2 |
| CO1 | 2 | | | | | | | | | 1 | | | 2 | 2 |
| CO2 | 3 | | | | | | | | | 2 | | | 3 | 3 |
| CO3 | | 2 | | | | | | | | 2 | | | 2 | 2 |
| CO4 | 3 | | | | | | | | | 2 | | | 3 | 3 |

| Syllabus | | |
|-----------------|---|-----------|
| Unit No. | Contents | Mapped CO |
| I | Introduction: Starting MATLAB, Working in command window, Arithmetic operations, Display formats, Elementary Math Built-in functions, Defining scalar variables, useful commands for managing variables, Script files, Examples of MATLAB applications | CO1,CO2 |

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|-----|--|---------------------|
| II | Creating arrays and Mathematical operations with arrays: Creating 1-dimensional and 2- dimensional arrays, The Transpose operator, Array addressing, using a colon: in addressing arrays, Adding elements to existing variables, Deleting elements, Built in functions for handling arrays, Strings and strings as variables, Addition and Subtraction, Array Multiplication and Division, Element-by-Element operations, using arrays in MATLAB built-in math functions, Built in functions for analysing arrays, Generation of Random Numbers, Examples of MATLAB applications. | CO1,CO2,C O4 |
| III | Two Dimensional and Three Dimensional Plots: plot, fplot commands, Formatting a plot, plots with logarithmic axes, error bars, special graphics, Histograms, Polar plots, putting multiple plots on the same page, Multiple figure windows, Examples, Line plots, Mesh and surface plots, plots with special graphics, The view command, Examples of MATLAB applications | CO1,CO2,C O3,CO4 |
| IV | Programming in MATLAB: Relational and Logical operators, conditional statements, The switch-case statement, Loops, Nested Loops and Nested conditional statements, The break and continue commands, creating a function file, structure of a function file, Local and Global variables, saving a function file, using a User-defined function, Examples of simple User-defined functions, comparison between script files and function files. | CO1,CO2,C O4 |
| V | Polynomial, Curve-fitting, Interpolation, Numerical Analysis: Polynomials, curve fitting, Interpolation, The Basic fitting interface, Examples, solving equation of one variable, Finding minimum or maximum of a function, Numerical integration, ordinary differential equations. | CO2,CO3, CO4 |

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| Learning Resources | |
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| Text Books | |
| 1. MATLAB: An Introduction with applications – Amos Gilat, Wiley India Pvt. Ltd, 4th Ed., 2012. | |
| Reference Books | |
| 1. Getting started with MATLAB – Rudra Pratap, Oxford University Press, 2010 | |
| 2. MATLAB and SIMULINK for Engineers – Agam Kumar Tyagi, Oxford University Press, 2012. | |
