MATLAB PROGRAMMING

Course Code	20EC2601A	**Year**	III	**Semester**	II
Course Category	Open Elective II	**Branch**	ECE	**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	
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	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**
CO1	2				2					1			2	2
CO2	3				3					2			3	3
CO3		2			2					2			2	2
CO4	3				3					2			3	3
Average * (Rounded to nearest integer)	3	2			3					2			2	2

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
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,	CO1, CO2, CO4

	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.	
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, CO3,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, CO4
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
Text Books
1. Amos Gilat - MATLAB: An Introduction with applications – Wiley India Pvt. Ltd, 4th Ed., 2012. 2. Rudra Pratap - Getting started with MATLAB – Oxford University Press, 2010
Reference Books
1. Agam Kumar Tyagi - MATLAB and SIMULINK for Engineers – Oxford University Press, 2012.
e- Resources & other digital material
1. https://www.udemy.com/MATLAB/Online-Course 2. https://nptel.ac.in/courses/103/106/103106118
