

ADD-ON COURSES

Title of the Course : **Introduction to MATLAB Programming**
Course Code : **MTHADD 1.3**
Nature of the Course : **ADD-ON Course**
Total Credits : **02 (L=1, T=1, P=2)**
Distribution of Marks : **35 (End Sem) + 15 (In-Sem)**

Course Objectives: The objectives of this Course are-

- Understand MATLAB's computing environment.
- Be proficient in MATLAB programming basics.
- Apply MATLAB to solve mathematical problems and visualize data.
- Develop simple user interfaces.

UNITS	CONTENTS	L	T	P	Total Hours
I (5 Marks)	Overview of MATLAB; Navigating the MATLAB desktop environment; Basic commands; Using the MATLAB help system; Introduction to MATLAB files and workspace.	01	01	02	04
II (5 Marks)	MATLAB syntax rules; Working with variables and arrays; Scalar and vector operations; Introduction to data types; Reading from and writing to files; String manipulation.	01	01	04	06
III (5 Marks)	Matrix arithmetic; Array operations; Logical indexing; Multidimensional arrays; Basic statistical operations; Matrix decomposition techniques.	01	01	04	06
IV (5 Marks)	Basic plotting functions; Customizing plots (titles, labels, legends); Types of graphs (line, scatter, bar, histogram, pie); 3D plots; Using the Plot Editor.	01	01	04	06
V (5 Marks)	Writing scripts; Control flow statements (if-else, switch-case); For and while loops; Writing and calling functions; Anonymous functions; Debugging MATLAB code.	01	01	04	06
VI (5 Marks)	Working with cell arrays; Accessing data in cell arrays; Introduction to structures; Manipulating structure arrays; Advantages of using advanced data structures.	01	01	02	04
VII (5 Marks)	Basics of graphical user interfaces; Using GUIDE (Graphical User Interface Development Environment); Designing simple GUIs; Callback functions.	01	01	02	04
	Total	07	07	18	32

Where, **L: Lectures** **T: Tutorials** **P: Practicals**

MODES OF IN-SEMESTER ASSESSMENT:**(15 Marks)**

- One Internal Examination - **10 Marks**
- Others (any one or more) - **05 Marks**
 - Seminar presentation on any of the relevant topics
 - Assignment
 - Group Discussion
 - Quiz
 - Viva-Voce

LEARNING OUTCOMES:

After the completion of this course, the learner will be able to:

- Navigate MATLAB's IDE.
- Implement MATLAB syntax and operations.
- Manipulate matrices and arrays.
- Create plots and graphical representations of data.
- Write scripts and functions for basic computational tasks.

SUGGESTED READINGS:

1. Stormy Attaway, "MATLAB: A Practical Introduction to Programming and Problem Solving", 4th Edition, 2016, Elsevier.
2. Stephen J. Chapman, "MATLAB Programming for Engineers", 5th Edition, 2018, Cengage Learning.
3. Amos Gilat, "MATLAB: An Introduction with Applications", 6th Edition, 2017, Wiley.