MCA407: MATLAB

Teaching Scheme	Examination Scheme
Lectures: 3 hrs/Week Tutorials: 1 hr/Week Credits: 4	Class Test -12Marks Teachers Assessment - 6Marks Attendance – 12 Marks End Semester Exam – 70 marks

Prerequisite: - Basic Mathematics, Elementary knowledge of computer programming and basic understanding of matrices, linear algebra, calculus, trigonometric functions and geometry.

Course Objectives:

Familiarization of the syntax, semantics, data-types and library functions of numerical computing languages such as MATLAB and/or SCILAB, and application of such languages for implementation/simulation and visualization of basic mathematical functions relevant to electronic applications.

Detailed Syllabus

UNIT I (6 Hours)
Basics of MATLAB: Starting MATLAB, matrices, variables, and the colon operator, linspace, plotting vectors.

UNIT II (10 Hours)
Matrices: Typing matrices, concatenating matrices, useful matrix generators, subscripting, end as subscript, deleting rows or columns, matrix arithmetic, transpose.

UNIT III (10 Hours)
MATLAB Programming: Logical expressions, for loops, while loops, conditional programming, scripts, function m scripts, return statements, recursive programming.

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UNIT IV (10 Hours)

Basic Graphics: Plotting many lines, adding plots, plotting matrices, clearing the figure window, subplots.

Graphics of Functions of Two Variables: Basic plots, color maps, color bar.

UNIT V (10 Hours)

Text Strings and cell arrays: String matrices, comparing strings, string manipulations, converting numbers to strings, using strings as commands, introduction and use of cell arrays.

UNIT VI (10 Hours)

Multidimensional Arrays: Generating Multidimensional Grids, Operations with Multidimen-sional Arrays.Digital Image Processing using MATLAB: Reading and writing gray scale image, Conversion of gray scale image to binary image, finding the number of density, perimeter, branch, area points of the image.

Text and Reference Books

1. Basics of MATLAB and beyond, Andrew knight, CRC Press LLC, 2000.
2. A Guide to MATLAB for Beginners and Experienced Users, Brian R. Hunt, Ronald L. Lipsman, Cambridge University, 2005.
3. Digital Image Processing using METLAB, Rafel, Richard & Steven, Pearson, 2007.

Course Outcomes:
On successful completion of the course, the students should be able to
1. Understand the need for simulation/implementation for the verification of mathematical functions.
2. Understand the main features of the MATLAB program development environment to enable their usage in the higher learning.
3. Implement simple mathematical functions/equations in numerical computing environment such as MATLAB.
4. Interpret and visualize simple mathematical functions and operations thereon using plots/display.
5. Analyze the program for correctness and determine/estimate/predict the output and verify it under simulation environment using MATLAB tools.