

ANNAMALAI UNIVERSITY
FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

25ECVAC01	DATA ANALYSIS, VISUALIZATION AND SCIENTIFIC COMPUTATION WITH MATLAB	L	T	P
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UNIT I : INTRODUCTION

Introduction to MATLAB-Getting into MATLAB- Constants (Built-in Constants) and Variables-Assignment Statements-Operators and Expressions-Operator precedence-Vectors and Matrices-Simple MATLAB Scripts-User defined functions-passing arguments to functions.

UNIT II : DATA IMPORT-EXPORT UTILITIES

Creating random data-Importing and Exporting Data-Importing Data into the Workspace -Exporting Data from the Workspace -Importing data to Excel files- Exporting Data from the Excel files-Using MAT-Files for Variables-Saving and loading MATLAB variables-Problems with importing formatted data-MATLAB commands to import audio, image and video formats.

UNIT III : STATISTICAL FUNCTIONS

MATLAB Statistical Functions-minimum-maximum-sum-product-mean-standard deviation-mode-median-Built in functions for set operations like Union, Intersection, Unique set, set difference and set exclusive OR- Sorting operation - sorting elements within a vector - sorting rows within a matrix by values in a column- variance of a vector - covariance of a matrix- correlation coefficient function.

UNIT IV : GRAPHICS AND VISUALIZATION

Basic plotting function- subplots- Customizing Plots- Logarithmic plots- Histograms and Barchart-3D plots functions- Creating mesh and surface plots- contour functions- other 3D plot functions- Display images- Printing graphics- Introduction to Graphical User Interface(GUIs).

UNIT V : DATA ANALYSIS METHODS

Matrix solutions to systems of Linear Algebraic Equation- Curve Fitting- Interpolation and Extrapolation - Regression - Finding roots of polynomials-Visualizing solution of Ordinary Differential Equations (ODEs).

REFERENCES

1. Stormy Attaway, Matlab: A Practical Introduction to Programming and Problem Solving, Butterworth-Heinemann; 4th edition, 2016.
2. Brian Hahn and Dan Valentine, Essential MATLAB for Engineers and Scientists, Academic Press; 6th edition, 2016.
3. Stormy Attaway, Matlab: A Practical Introduction to Programming and Problem Solving, Butterworth-Heinemann, 5th edition, 2018.
4. C. Henry Edwards, David E. Penney, David Calvis, Differential Equations: Computing and Modeling (5th Edition) (Edwards, Penney & Calvis, Differential Equations: Computing and Modeling Series) Pearson, 5th Edition, 2014.