NIRMA UNIVERSITY
SCHOOL OF TECHNOLOGY, INSTITUTE OF TECHNOLOGY
B. Tech. Electronics and Communication Engineering

OPEN ELECTIVE

L	T	P	C
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Course Code	
Course Title	**MATLAB for Engineers**

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. Utilize a methodical approach to identify, formulate, and solve computational problems.
2. Apply MATLAB in solving algebra calculus problems.
3. Apply various techniques to solve and visualize engineering-related computational problems using MATLAB.

Syllabus: **Teaching Hours:30**

UNIT I : Introduction 02
Importance of MATLAB, MATLAB environment, various toolboxes, using MATLAB as a calculator

UNIT II : MATLAB Basics 05
Variables and arrays, operations on variables and arrays, matrix operations, displaying output data, introduction to plotting, data files, built-in MATLAB functions, user defined function

UNIT III : Branching and Loops 05
Relational and logic operators, branches, WHILE loops FOR loops, SWITCH, BREAK, CONTINUE, vectorization, MATLAB profiler

UNIT IV : 2D/3D Plots 03
2D plots, 3D plots, data distribution plots, polar plots, contour plots, surface plots

UNIT V : Numerical Methods 04
Linear algebra and vector analysis, newton and bisection methods, numerical solution to ordinary difference equations, curve fitting, interpolation, least squares regression

UNIT VI : Cell Arrays, Structures, Importing Data 05
Cell Arrays, structure arrays, string, sorting & searching, importing data into MATLAB, file Input / Output functions, working with spreadsheet and low-level data file

UNIT VII : Advanced Features 03
Graphical User Interfaces and GUIDE, application development, Simulink, MATLAB with cross language platforms

UNIT VIII : Applications 03
Optimization methods, Signal processing, image processing, machine learning, system level modelling

Self-Study:

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

Laboratory Work:

Laboratory work will be based on above syllabus with minimum 10 experiments to be incorporated.

Suggested Readings:

1. MATLAB Programming with Applications for Engineers, Stephen J. Chapman, Brooks/Cole Publishing Co.
2. Jamal T. Manassah, Elementary Mathematical and Computational Tools for Electrical and Computer

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Engineers Using MATLAB, CRC Press
3. Rudra Pratap, Getting Started with MATLAB, Oxford University Press
4. Stormy Attaway, MATLAB: A Practical Introduction to Programming and Problem Solving, Butterworth-Heinemann Publishers

L = Lecture, T = Tutorial, P = Practical, C = Credit