Nirma University
School of Technology, Institute of Technology
B. Tech (Instrumentation and Control Engineering)

Semester VII

L	T	P	C
2	0	2	3

Course Code	**2ICDE63**
Course Title	**Programming with Python & MATLAB**

(Offered to the student who has not taken similar course under open elective course)

Course Outcomes (CO):

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

1. illustrate basics of Python and MATLAB programming
2. identify appropriate libraries of Python to apply for various computational problems.
3. develop applications using Python.
4. apply various techniques to solve engineering-related computational problems using MATLAB.

Syllabus: **Teaching Hours**

UNIT 1: Introduction **01**

Importance of Python and MATLAB programming.

UNIT 2: Python basics **09**

Basic elements of Python, operators, control statements and loops, strings, list, array, tuple, set, dictionary, functions in python, various built in functions in python, reading text from a file, writing text into a file, module and packages in python.

UNIT 3: Libraries in Python **06**

Introduction to various libraries in Python like Numpy, Matplotlib, Pandas.

UNIT 4: Branching, Loops and Plotting in MATLAB **04**

Relational and logic operators, branches, WHILE loops FOR loops, SWITCH, BREAK, CONTINUE, sorting & searching, plotting, 2D plots, 3D plots, reading text from a file, writing text into a file.

UNIT 5: Advanced features and development of applications with Python and MATLAB **10**

GUI programming, application development, data acquisition, optimization methods, signal processing, image processing, machine learning, deep learning, curve fitting and data analysis, robotics system.

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 consist of minimum 10 experiments based on the above syllabus.

References :

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 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.
5. R Nageshwara Rao, Core Python Programming, dreamtech.
6. Wesley J. Chun, Core Python Programming, Prentice Hall.
7. Burkhard Meier , Python GUI Programming Cookbook, Packt Publication.

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