

Devi Ahilya University, Indore, India Institute of Engineering & Technology				II Year B.E. (Electronics and Instrumentation Engg.)			
Subject Code & Name	Instructions Hours per Week			Credits			
3EIRL1 SOFTWARE WORKSHOP	L	T	P	L	T	P	Total
	0	0	2	0	0	1	1

Learning Objectives:

- To provide background and fundamentals of Matlab tool and understand Matlab programming language.
- To provide an overview of Simulink and working with continuous, discrete and dynamics systems.
- To understand the concept and importance of Image processing and Machine learning with the use of Matlab.

Prerequisites: C Language

COURSE CONTENTS

Unit –I

MATLAB: Basics of MATLAB, Expressions and Basic Commands of MATLAB, Data Types, Variables and Operators, Decision Control Statements, Loops Control Statements, Vectors, Matrix, Arrays, Strings, Functions, Data Import and Export, Plotting a Graph, Graphics, Basic Algebra in MATLAB

Unit-II

Simulink: Simulink graphical environment, blocks and parameters, signals and scopes. Basic algorithms: mathematical operators’ logic and conditional statements. Dynamic systems, discrete systems, continuous systems, simulation time. practices working with math and logic operators.

Unit-III

Image Processing: Working with images in MATLAB: import images, grey and colour images, contrast adjustment. Segmentation is the image, thresholding, intensity, and binary images. Pre and post-processing techniques like improving segmentation, fliting noise, background subtraction, and binary morphology. Image classification and processing.

Unit-IV

Machine learning: introduction, classification workflow: import data, process, extract features build and evaluate model, Engineering features: types of signals, calculating summary

statistics, finding peaks, computing derivatives, calculating correlation, and automatic features extraction, classification models: training and testing, data, machine learning models and training models.

Unit-V

Small project using based on the above learning image processing and machine learning

Learning Outcomes:

Upon completing the course, students will be able to:

- Write Matlab-based application programs that have been used extensively to solve complex engineering problems
- Create a representative model of your laboratory equipment or processes in a visual environment with Simulink
- Learn to apply the concepts relating to Image processing and machine learning.

BOOKS RECOMMENDED:

- [1].Dr. Brijesh Bakariya , Dr. Kulwinder Singh Parmar, Fundamental Concepts of MATLAB Programming: From Learning the Basics to Solving a Problem with MATLAB, BPB Publications, August 18, 2020.
- [2].Digital Image Processing by Rafael C Gonzalez & Richard E Woods, 3rd Edition.
- [3]. Pattern Recognition and Machine Learning, Christopher Bishop, Springer, 20093.