List of Laboratory Experiments

Basic Simulation Lab							
Course Code	**Hours / Week**				**Maximum Marks**		
PC CE 409	L	T	P	C	CIA	SEE	Total
	0	0	2	1	40	60	100
Number of classes: 20-24 hours	**Prerequisites: Engineering Mathematics**						
Branch: ECE	**Semester: IV**						

Course overview:

This course provides a comprehensive introduction to MATLAB and Simulink, equipping students with essential skills for numerical computation, data analysis, and system modeling. It covers fundamental programming concepts, matrix operations, data visualization, and the application of built-in functions. Emphasis is placed on hands-on practical exercises to solidify understanding and develop problem-solving abilities.

Course objectives:

i. Master the creation and manipulation of 1-D arrays and matrices and perform various arithmetic and algebraic operations.

ii. Understand and apply MATLAB's built-in functions for data analysis, including statistical and cumulative operations.

iii. Develop proficiency in creating and running MATLAB script and function files for automating tasks and defining custom operations.

iv. Gain the ability to create, customize, and interpret various types of 2-D plots, including linear, semi-log, and log-log scales.

Course outcomes:

CO Number	CO Description	K-level
CO-1	Demonstrate the creation of arrays and matrices and perform simple matrix operations.	K-3
CO-2	Experiment with the arithmetic, trigonometric and logical operations on matrices.	K-3
CO-3	Interpret the different string operations on a string.	K-3
CO-4	Illustrate script-file and function files for different operations.	K-2
CO-5	Demonstrate the knowledge of basic plotting functions	K-2
CO-6	Apply knowledge of Simulink to design simple circuits	K-3
Sl. No.	**EXPERIMENT NAME**	**CO**
1.	Create 1-D arrays and matrices of given size and perform arithmetic operations- Addition, Subtraction, Multiplication and Exponentiation.	CO-1
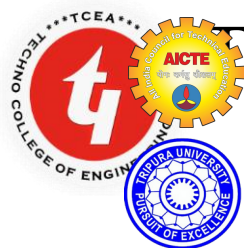
2.	Perform matrix operation to obtain Obtaining Modified Matrix - Inverse, Transpose, with Appended and Deleted Elements.	CO-1
3.	Create a matrix of given size and perform matrix manipulation operation Concatenating, Indexing, Sorting, Shifting	CO-1
4.	Perform matrix operation for Reshaping, Resizing and Flipping about a Vertical Axis / Horizontal Axis.	CO-1
5.	Create a matrix of given size and perform trigonometric, relational and logical operations	CO-2
6.	Create a matrix of given size and demonstrate the operation of various built-in functions like sum, cumulative sum, standard deviation, product, cumulative product etc	CO-2
7.	Generate a string and perform various string operation	CO-3
8.	Write script files for simple arithmetic and logical operations.	CO-4
9	Write function files for user-defined operations	CO-4
10	Perform basic plotting, plot multiple graphs in a plot, demonstrate the use of sub-plot command, stylize the plots. Illustrate A Rectangular Plot, (B). A Semi log Plot, (C). A log-log Plot	CO-5
11	Model simple circuits, equations using simulink	CO-6
12	Create a Structure, An Array of Structures and Write Commands to access the elements of the created structure and array of structures	CO-6