Techno College of Engineering Agartala

An Engineering College Approved by AICTE, MHRD, Govt. of India

Affiliated to Tripura University (A Central University),

Department of Electrical & Computer Engineering

List of Laboratory Experiments

Electrical with Computer Science (ECS) Laboratory							
Course Code	**Hours / Week**				**Maximum Marks**		
PC ECS 308	L	T	P	C	CIA	SEE	Total
	0	0	2	1	40	60	100
Number of classes: 24 hours			**Prerequisites:** Basic Electrical Engineering, Basics of Computer Programming				
Branch: ECSE			**Semester: III**				

Course overview:

This lab integrates electrical engineering concepts with Python programming. Students simulate and analyze electrical circuits using Python and visualization tools like SchemDraw. The focus is on verifying key electrical theorems, circuit analysis techniques, and dynamic behavior.

Course objectives:

1. **Integrate electrical engineering principles with Python programming** for simulation, analysis, and verification of circuits.

2. **Develop the ability to model and solve electrical circuits** using tools like SchemDraw, NumPy, and Matplotlib.

3. **Validate fundamental electrical theorems and techniques** (Ohm's Law, KCL, KVL, Thevenin, Norton, etc.) through code-based experiments.

4. **Enhance problem-solving skills** by applying mesh and nodal analysis, and analyzing RLC circuit behavior across frequencies.

Course outcomes:

CO Number	CO Description	K-level
CO-1	Solve Numerical Based on Electrical Circuits using Python Programming	K-3
CO-2	Create electrical Circuits by Writing Python Programming	K-5
CO-3	Verify the various Theorems related to Electrical Circuits Using Python Programming	K-6
CO-4	Compare Theoretical and Practical Data for various electrical parameters.	K-6
Sl. No.	**EXPERIMENT NAME**	**CO**

Department of Electrical & Computer Engineering

1.	Write a Program in Python and Design Electrical Circuit using SchemDraw and verify Ohm's Law.	CO1
2.	Write a Program in Python and Design Electrical Circuit using SchemDraw and verify KCL & KVL.	CO1
3.	Write a Program in Python and Design Electrical Circuit using SchemDraw and verify Superposition Theorem	CO2
4.	Write a Program in Python and Design Electrical Circuit using SchemDraw and verify Maximum Power Transfer Theorem.	CO2
5.	Write a Program in Python and Design Electrical Circuit using SchemDraw and verify Thevenin's Theorem.	CO2
6.	Write a Program in Python and Design Electrical Circuit using SchemDraw and verify Norton Theorem.	CO2
7.	Solve Problem in Electrical Circuits using Mesh Analysis using Python Programming.	CO3
8.	Solve Problem in Electrical Circuits using Nodal Analysis using Python Programming.	CO3
9.	Evaluate various electrical parameters of given Circuit using Python Programming	CO4
10.	Build an R-L-C circuit using Python Programing and analyze the frequency Response.	CO4