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 Engineering

List of Laboratory Experiments

Basic Electrical Measurements Laboratory							
Course Code	**Hours / Week**				**Maximum Marks**		
PC EE 409	L	T	P	C	**CIA**	**SEE**	**Total**
	0	0	2	1	40	60	100
Number of classes: 24 hours			**Prerequisites:** Electrical Measurements				
Branch: EE			**Semester: IV**				

Course overview:

The **Basic Electrical Measurement Laboratory** is designed to provide students with practical experience in measuring electrical quantities and understanding sensor behavior used in industrial and laboratory applications. The course covers a wide range of measurement techniques, including bridge methods for determining inductance, capacitance, and resistance, as well as power measurement in three-phase systems using the two-wattmeter method.

Students gain hands-on experience with instruments such as DC ammeters, voltmeters, meggers, and sensor systems like thermistors, RTDs, thermocouples, strain gauges, and LVDTs. The lab emphasizes accurate measurement, calibration, sensitivity analysis, and the limitations of different instruments.

By the end of the course, students will have a strong foundation in electrical and sensor measurement techniques, enabling them to apply these skills in instrumentation, automation, and electrical engineering projects.

Course objectives:

1. **To develop practical skills in measuring electrical parameters** such as inductance, capacitance, low and high resistance, and three-phase power using standard bridge techniques and instruments.
2. **To understand the working principles and limitations** of measuring devices like DC ammeters, voltmeters, and insulation resistance testers.
3. **To study the characteristics and behavior of temperature sensors** such as thermistors, RTDs, and thermocouples.
4. **To perform displacement and strain measurements** using LVDTs and strain gauges, and determine their sensitivity and calibration.

Course outcomes:

CO Number	CO Description	K-level
CO-1	Apply the DC and AC bridges in measurement.	K-3

CO-2	Demonstrate the application of various measurement devices, their characteristics, operation and limitations.	K-3
CO-3	Understand the characteristics of different sensors	K-2
CO-4	Understand the application of different transducers	K-2
Sl. No.	**EXPERIMENT NAME**	**CO**
1.	Measurement of L using a bridge technique.	CO1
2.	Measurement of C using a bridge technique.	CO1
3.	Measurement of Low Resistance using Kelvin's double bridge.	CO1
4.	Measurement of High resistance and Insulation resistance using Megger.	CO1
5.	Measure power in 3-phase load by Two-wattmeter method .	CO2
6.	Use and Limitations of DC Ammeter and DC Voltmeters	CO2
7.	Determination of Characteristics of Thermistors.	CO3
8.	Study of Characteristics of RTD for the Measurement of Temperature	CO3
9.	Temperature Measurement using Thermocouple and study of its characteristics.	CO4
10.	Strain measurement using strain gauges and cantilever assembly.	CO4
11.	Determination of sensitivity of Strain gauges and cantilever assembly trainer.	CO4
12.	To study the Input-Output characteristic of LVDT	CO4
13.	To determine the sensitivity of LVDT.	CO4