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

Electrical Circuits Laboratory							
Course Code	**Hours / Week**				**Maximum Marks**		
PC EE 308	L	T	P	C	**CIA**	**SEE**	**Total**
	0	0	2	1	40	60	100
Number of classes: 24 hours			**Prerequisites: B**asic Electrical Engineering, Mathematics differential equations and Laplace Transformation				
Branch: EE			**Semester: III**				

Course overview:

The **Electrical Circuits Laboratory** is designed to provide students with practical exposure to fundamental and advanced concepts in electric circuit theory. The lab supports the theoretical knowledge gained in classroom lectures by offering hands-on experience with real-world circuits and measurements.

This course introduces students to a wide range of electrical circuit experiments that reinforce the understanding of network theorems, transient and steady-state responses, frequency response analysis, resonance, and two-port network parameters. Through systematic experimentation, students gain insights into the behavior of R, L, and C components under different excitation conditions, including DC and AC inputs, transient states, and continuous periodic signals.

Course objectives:

i. To verify fundamental network theorems such as Thevenin's and Maximum Power Transfer Theorem through practical implementation and analysis..
ii. To analyze the transient and steady-state behavior of R-L, R-C, and R-L-C circuits under various input conditions and determine key parameters like time constants, damping, and resonance frequency.
iii. To study frequency response characteristics of first and second-order circuits and evaluate their transfer functions using experimental methods.
iv. To determine and validate two-port network parameters (Z, Y, h, and transmission) for single and interconnected electrical networks.

Course outcomes:

CO Number	CO Description	K-level
CO-1	Understand to apply condition of resonance in Electrical Circuits and also to determine the Circuit Parameters and Mutually Coupled Circuits analysis.	K-2
CO-2	Determine the Transient and Steady-state performances of Electrical Circuits	K-3
CO-3	Analyze characteristics and time responses of Electrical Circuits due to different continuous signals.	K-3

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CO-4	Determine the Parameters of Two Port Networks and their applications in the higher courses of Electrical Engineering	K-4
Sl. No.	**EXPERIMENT NAME**	**CO**
1.	Experiments for the Proof of Thevenin's and Maximum Power Transfer Theorem.	CO1
2.	Study of series R-L-C Resonance Circuits and determination of Resonance frequency and Bandwidth.	CO1
3.	Study of Transient Responses of R-L & R C series circuits and determination of time constants of these circuits.	CO1
4.	Study of Transient Characteristics of R-L-C series Circuit and observation of Characteristics of Under damped, Over damped and Critically damped 2^{nd} Order R-L-C Circuit by varying circuit elements.	CO2
5.	Study of Characteristics of time responses of Series Circuits due to continuous periodic Triangular wave form at different frequency.	CO3
6.	Study of frequency response of 1st order and 2nd Order series Circuits and determination of Transfer Function of Circuits.	CO3
7.	Determination of Open Circuit Z-parameters and Short Circuit Y-Parameters of a two Port D.C. circuit and verifications of them.	CO4
8.	Determination of Transmission and hybrid Parameters of a two Port D.C. Network.	CO4
9.	Determination of overall Short Circuit Y Parameters of a Parallel connected two Identical two port Networks.	CO4
10.	Determination of overall Transmission Parameters of Cascade combination of two identical two ports Network.	CO4