

ELECTRICAL CIRCUITS LABORATORY

II Semester: ECE / EEE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AEEC03	Foundation	L	T	P	C	CIA	SEE	Total
		-	-	3	1.5	30	70	100
Contact Classes: Nil		Tutorial Classes: Nil		Practical Classes: 36		Total Classes: 36		
Prerequisites: There are no prerequisites to take this course.								
<p>I. COURSE OVERVIEW: Electrical circuits laboratory examines the basic laws, network reduction techniques, network theorems, characteristics of AC and two port network, design of transformer, measurement of electrical parameters. It includes the basic concepts of MATLAB.</p> <p>II. COURSE OBJECTIVES: The students will try to learn:</p> <p>I. The basic law, network reduction techniques and network theorems for circuit analysis. II. The characteristics of AC and two port networks. III. The measurement of electrical quantities using various electrical devices. IV. To built the prototype of transformer and study its properties.</p> <p>III. COURSE SYLLABUS:</p> <p>Expt. 1: VERIFICATION OF OHM'S LAW AND KIRCHOFF LAWS Draw the V-I characteristics of resistor element, examine voltage and current division in an electrical circuit using hardware and digital simulation.</p> <p>Expt. 2: MESH ANALYSIS Determination of mesh currents in complex electrical circuit using hardware and digital simulation.</p> <p>Expt. 3: NODAL ANALYSIS Determination of nodal voltages in complex electrical circuit using hardware and digital simulation.</p> <p>Expt. 4: CHARECTERISTICS OF PERIODIC WAVEFORMS Calculate Instantaneous, Peak, Peak to peak, Average and RMS values of periodic wave form using hardware and digital simulation.</p> <p>Expt. 5: DETERMINATION OF CIRCUIT IMPEDANCE Find the impedance of series RL, RC and RLC circuits using hardware and digital simulation.</p> <p>Expt. 6: THEVENIN'S THEOREM Determine load or unknown current using Thevenin's equivalent circuit using hardware and digital simulation.</p> <p>Expt. 7: NORTON'S THEOREM Determine load or unknown current using Norton's equivalent circuit using hardware and digital simulation.</p> <p>Expt. 8: SUPERPOSITION THEOREM Verify of superposition theorem using hardware and digital simulation.</p> <p>Expt. 9: RECIPROCITY THEOREM Verify of reciprocity theorem using hardware and digital simulation.</p> <p>Expt. 10: SERIES AND PARALLEL RESONANCE Verification of series and parallel resonance using hardware and digital simulation.</p>								

Expt. 11: MEASUREMENT OF POWER CONSUMED BY A FLUORESCENT LAMP

Examine the power consumed by Fluorescent lamp using electrical devices using hardware and digital simulation.

Expt. 12: DESIGN OF CHOKE AND SMALL TRANSFORMER

Measure resistance and inductance of coil and construct the winding of transformer using winding machine using hardware and digital simulation.

Expt. 13: Z AND Y PARAMETERS

Determine the open circuit and short circuit parameters for two port network using hardware and digital simulation.

Expt. 14: H AND ABCD PARAMETERS

Determine the hybrid and transmission line parameters for two port network using hardware and digital simulation.

IV. REFERENCE BOOKS:

1. A Chakrabarti, "Circuit Theory", Dhanpat Rai Publications, 6th Edition, 2006.
2. William Hayt, Jack E Kemmerly S.M. Durbin, "Engineering Circuit Analysis", Tata McGraw Hill, 7th Edition, 2010.
3. K S Suresh Kumar, "Electric Circuit Analysis", Pearson Education, 1st Edition, 2013.

V. WEB REFERENCES:

1. <https://www.ee.iitkgp.ac.in>
2. <https://www.citchennai.edu.in>
3. <https://www.iare.ac.in>