

## FUNDAMENTALS OF ELECTRICAL ENGINEERING LABORATORY

I Semester: CSE / IT								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AEEB05	Foundation	L	T	P	C	CIA	SEE	Total
		-	-	3	1.5	30	70	100
<b>Contact Classes: Nil</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: 36</b>			<b>Total Classes: 36</b>			
<p><b>I. COURSE OVERVIEW:</b>                      The objective of the Basic Electrical Engineering Laboratory lab is to expose the students to the electrical circuits and give them experimental skill. The purpose of lab experiment is to continue to build circuit construction skills using different circuit element. It provides hands-on experience by examining the performance of electrical components.</p> <p><b>II. OBJECTIVES:</b>  <b>The course should enable the students to:</b></p> <p>I The basic laws, network reduction techniques and theorems for different circuits.                      II The performance characteristics of AC series and parallel circuits for measurement of electrical quantities using digital simulation tools.                      III Gain knowledge on electrical components like choke coil and fluorescent lamp.</p> <p><b>III. COURSE OUTCOMES:</b>  <b>After successful completion of the course, students should be able to:</b></p> <p>CO 1 <b>Analyze an electric circuit using Ohm's and Kirchhoff's laws, nodal and mesh analysis.</b> Analyze                      CO 2 <b>Apply various network theorems for reducing complex networks into simple equivalent network.</b> Apply                      CO 3 <b>Examine the alternating quantities for different periodic wave forms and the passive networks.</b> Understand                      CO 4 <b>Examine the performance of choke coil and fluorescent lamp by measuring various electrical quantities.</b> Understand</p>								
<b>IV. SYLLABUS:</b>								
<b>LIST OF EXPERIMENTS</b>								
<b>Expt. 1</b>	<b>OHM'S LAW , KIRCHHOFF'S CURRENT LAW AND VOLTAGE LAW</b>							
Verification of ohm's law, Kirchhoff's current and voltage laws using hardware and digital simulation.								
<b>Expt. 2</b>	<b>VOLT – AMPHERE METHOD</b>							
Determination of unknown resistance and its temperature dependency.								
<b>Expt. 3</b>	<b>MESH ANALYSIS</b>							
Determination of mesh currents using hardware and digital simulation.								
<b>Expt. 4</b>	<b>NODAL ANALYSIS</b>							

Measurement of nodal voltages using hardware and digital simulation.	
<b>Expt. 5</b>	<b>SINGLE PHASE AC CIRCUITS</b>
Calculation of average value, RMS value, form factor, peak factor of sinusoidal wave.	
<b>Expt. 6</b>	<b>IMPEDANCE OF SERIES RL CIRCUIT</b>
Examine the impedance of series RL Circuit	
<b>Expt. 7</b>	<b>IMPEDANCE OF SERIES RC CIRCUIT</b>
Measure the impedance of series RC Circuit	
<b>Expt. 8</b>	<b>IMPEDANCE OF SERIES RLC CIRCUIT</b>
Calculate the impedance of series RLC Circuit	
<b>Expt. 9</b>	<b>MEASUREMENT OF POWER CONSUMED BY A FLUORESCENT LAMP</b>
To obtain power consumed and power factor of a fluorescent lamp, operated at different voltages.	
<b>Expt. 10</b>	<b>CHOKE COIL PARAMETERS</b>
Determination of internal resistance and inductance of choke coil.	
<b>Expt. 11</b>	<b>THEVENIN'S THEOREM</b>
Reform conversion of complex network into simple series circuit.	
<b>Expt. 12</b>	<b>NORTON'S THEOREM</b>
Reform conversion of complex network into simple parallel circuit.	
<b>Reference Books:</b>	
<ol style="list-style-type: none"> <li>1. A Chakrabarti, "Circuit Theory", Dhanpat Rai Publications, 6<sup>th</sup> Edition, 2006.</li> <li>2. William Hayt, Jack E Kemmerly S.M. Durbin, "Engineering Circuit Analysis", Tata McGraw-Hill, 7<sup>th</sup> Edition, 2010.</li> </ol>	
<b>Web References:</b>	
<ol style="list-style-type: none"> <li>1. <a href="https://www.ee.iitkgp.ac.in">https://www.ee.iitkgp.ac.in</a></li> <li>2. <a href="https://www.citchennai.edu.in">https://www.citchennai.edu.in</a></li> <li>3. <a href="https://www.iare.ac.in">https://www.iare.ac.in</a></li> </ol>	
<b>SOFTWARE AND HARDWARE REQUIREMENTS FOR A BATCH OF 30 STUDENTS:</b>	
<b>SOFTWARE:</b> Microsoft Windows 7 and MATLAB – V 8.5	
<b>HARDWARE:</b> 01 numbers of Intel Desktop Computers with 2 GB RAM	