

<b>Course Number and Name</b>												
BEE301- CIRCUIT THEORY												
<b>Credits and Contact Hours</b>												
3 & 45												
<b>Course Coordinator's Name</b>												
Ms G.Meena Kumari												
<b>Text Books and References</b>												
<p><b>TEXT BOOKS:</b></p> <p>1.Sudhaker A. and Shyam Mohan S.p., "Dircuits and Network Analysis and Synthesis" Tata McGrew Hill Co. Ltd., New Delhi, 1994.</p> <p>2.U.A Bakshi. "Electric Circuit Analysis ", Technical Publication, Pune.</p> <p><b>REFERENCE BOOKS:</b></p> <p>1.Edminister J.A. "Theory and Problems of Electric Circuits " Schaum's outline series, McGrew hill Book Company 2<sup>nd</sup> edition, 1983.</p> <p>2.Hyatt W.H. and Kemmerlay J.E. „Engineering Circuits Analysis“, McGrew Hill international Editions,1993.</p> <p>3. <a href="http://nptel.ac.in/courses/108102042/">http://nptel.ac.in/courses/108102042/</a></p>												
<b>Course Description</b>												
To develop problem solving skills and understanding of circuit theory through the application of techniques and principles of electrical circuit analysis to common circuit problems.												
<b>Prerequisites</b>						<b>Co-requisites</b>						
Basic Electrical and Electronics Engineering						NIL						
required, elective, or selected elective (as per Table 5-1)												
required												
<b>Course Outcomes (COs)</b>												
Co1- To develop an understanding of the fundamental laws and elements of electric circuits.												
Co2- To develop the ability to apply circuit analysis to DC and AC circuits												
Co3- To understand advanced mathematical methods such as Laplace and Fourier transforms along with linear algebra and differential equations techniques for solving circuits problem												
Co4- To learn the "alphabet" of circuits, including wires, resistors, capacitors, inductors, Voltage and current sources, and operational amplifiers.												
Co5- To understand about sinusoidal steady state analysis												
Co6- To analyse about coupled circuits												
<b>Student Outcomes (SOs) from Criterion 3 covered by this Course</b>												
	COs/SOs	a	b	c	d	e	f	g	h	i	j	k
	CO1	M	H	H	H	L	M	L			H	M
	CO2	M	H	H	M	M	H	M	M		L	M
	CO3	H	M		H	H		M			L	L
	CO4	H	M		H	H	L	M	M		L	M
	CO5	M	M	M	M	H		M			L	L
	CO6	M	H	H	H	L	M	L			H	M

## List of Topics Covered

### **UNIT I – BASIC CIRCUIT CONCEPTS**

**9**

Circuit elements – Kirchhoff's Law – V-I Relationship of R,L and C – Independent Sources – Dependent sources – Simple Resistive circuits – Networks reduction – Voltage division – current source transformation.- Analysis of circuit using mesh current and nodal voltage methods.

### **UNIT II – SINUSOIDAL STEADY STATE ANALYSIS**

**9**

Phasor – Sinusoidal steady state response concepts of impedance and admittance – Analysis of simple circuits – Power and power factors — Solution of three phase balanced circuits and three phase unbalanced circuits —Power measurement in three phase circuits.

### **UNIT III–NETWORK THEOREMS (BOTH AC AND DC CIRCUITS)**

**9**

Superposition theorem – Thevenin's theorem - Norton's theorem-Reciprocity theorem- Maximum power transfer theorem.

### **UNIT IV - TRANSIENT RESPONSE FOR DC CIRCUITS**

**9**

Transient response of RL, RC and RLC Circuits using Laplace transform for DC input with sinusoidal input.

### **UNIT V RESONANCE AND COUPLED CIRCUITS**

**9**

Series and parallel resonance – their frequency response – Quality factor and Bandwidth - Self and mutual inductance – Coefficient of coupling – Tuned circuits – Single tuned circuits.