

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech II Sem			
Course Code	<b>ELECTRICAL CIRCUIT ANALYSIS</b>				
Teaching	Total contact hours - 45	L	T	P	C
Prerequisite(s): Mathematics		3	0	0	3

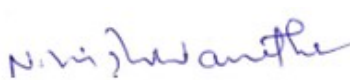
**Course Objective:**


1. To study the various network reduction techniques and the concept of source transformation.
2. To understand the applications of network topology to electrical circuits.
3. To study the concept of magnetic coupled circuit.
4. To understand the behavior of RLC networks for sinusoidal excitations.
5. To study the performance of R-L, R-C and R-L-C circuits with variation of one of the parameters and to understand the concept of resonance.
6. To understand the applications of network theorems for analysis of electrical networks.

**Course Outcomes:**

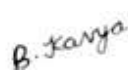
On Completion of the course, the students will be able to-	
CO1:	Analyse electrical networks in presence of active and passive elements.
CO2:	Analyse magnetic circuit with various dot conventions.
CO3:	Analyse steady state circuits
CO4:	Analyse series and parallel resonant circuits.
CO5:	Analyse electric circuits using Network Theorems.


  
University Nominee  
(Dr.Y.Srinivasa Kishore Babu)

  
Subject Expert  
(Dr.N.Viswanathan)

  
Subject Expert  
(Dr.B.Ravi Kumar)

  
Internal Member  
(Mr.T.Amar Kiran)

  
Internal Member  
(Mrs B Kavya Santhoshi)

  
Internal Member  
(Mr V Suresh)

  
Chairman-BOS  
(Dr.D.Ravi Kishore)

**Syllabus:**

**UNIT –I Network reduction techniques**

Series, Parallel, Series - parallel, Star-to- delta and Delta-to-star transformation, source transformation technique, nodal analysis and mesh analysis to DC networks with dependent and independent voltage and current sources.

**UNIT –II Network theorems (DC & AC Excitations)**

Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum Power Transfer theorem, Reciprocity theorem, Millman's theorem and compensation theorem.

**UNIT –III Magnetic Circuits**

Basic definition of MMF, flux and reluctance, analogy between electrical and magnetic circuits,

Faraday's laws of electromagnetic induction – concept of self and mutual inductance, Dot convention, coefficient of coupling and composite magnetic circuit, analysis of series and parallel magnetic circuits.

**UNIT –IV Single Phase A.C Systems**

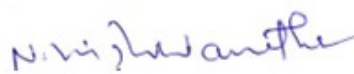
Periodic waveforms (determination of rms, average value and form factor), concept of phase angle and phase difference – waveforms and phasor diagrams for lagging, leading networks, complex and polar forms of representations. Steady state analysis of R, L and C circuits, power factor and its significance, real, reactive and apparent power, waveform of instantaneous power and complex power

**UNIT –V Analysis of AC Networks**

Extension of node and mesh analysis to AC networks, series and parallel resonance, selectively band width and Quality factor, introduction to locus diagram.



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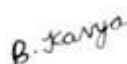
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**Text Books:**

1. Engineering Circuit Analysis by William Hayt and Jack E. Kemmerley, McGraw Hill Company, 6th edition
2. Fundamentals of Electrical Circuits by Charles K. Alexander and Mathew N.O. Sadiku, McGraw Hill Education (India)
3. Networks and Systems by D. Roy Choudhury, New Age International publishers

**Reference Books:**

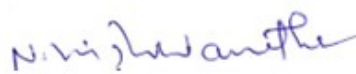
1. Network synthesis: Van Valkenburg; Prentice-Hall of India Private Ltd
2. Introduction to circuit analysis and design by Tildon Glisson. Jr, Springer Publications.
3. Circuits by A. Bruce Carlson, Cengage Learning Publications
4. Network Theory Analysis and Synthesis by Smarajit Ghosh, PHI publications
5. Electric Circuits by David A. Bell, Oxford publications
6. Circuit Theory (Analysis and Synthesis) by A. Chakrabarthy, Dhanpat Rai & Co.

**Web Links:**

1. [www.electrical4u.com](http://www.electrical4u.com)
2. [www.nptel.ac.in](http://www.nptel.ac.in)



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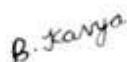
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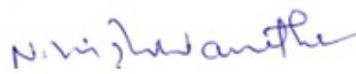
**CO-PO Mapping:**

( 1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	2	-	-	-	-	-	2	2	1
CO3	3	3	3	-	-	-	-	-	-	-	-	-
CO4	3	-	3	-	-	-	-	-	-	-	-	-
CO5	3	3		-	-	-	-	-	-	-	-	-



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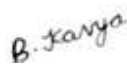
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