II Year I Semester **L T P C**

Code: 20EC3003 **3 0 0 3**

NETWORK ANALYSIS

Preamble This course aims at study of three phase systems, transient analysis, network synthesis and Fourier analysis for the future study and analysis of powersystems.

Course Objectives:

1. Summarize the properties of electrical elements and networks
2. Compute network variables with the help of various analytical methods
3. Evaluate the frequency response of electric networks
4. Select appropriate network theorems to analyze electric circuits.

Course Outcomes:

1. To study the concepts of passive elements, types of sources and various network reduction techniques.
2. To understand the behaviour of RLC networks for sinusoidal excitations
3. To understand the applications of network theorems for analysis of electricalnetworks
4. To study the concept of magnetic coupled circuits
5. Find the transient response of electrical networks for different types of excitations

CO – PO & CO – PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	PO11	P012	PSO1	PSO2	PSO3
CO1	3	3													
CO2	3	3													
CO3	3	3													
CO4	3	3													

Detailed Syllabus

Unit – I Introduction to Electrical Circuits 12 hrs

Basic electrical components and sources, Network reduction techniques, Source transformation, Nodal analysis, and Mesh analysis, Principle of duality

Unit – II Sinusoidal analysis on A.C Systems 14hrs

AC fundamentals, Concept of phasor and powers, Steady-state analysis of AC circuits R, RLand RLC circuits

Unit – III Coupled Circuits and Resonance 12hrs

Self and Mutual inductance, analysis of coupled circuits, Dot rule, conductively coupled equivalent circuits. Series and Parallel resonance.

Unit – IV Network Theorems and Two port network 14hrs

Superposition, Thevenin's, Norton's, Milliman's, Reciprocity, Max Power Transfer,Substitution, - problem solving using dependent sources also

Two port network parameters – Z, Y, ABCD, Hybrid parameters and their relations.

Unit – V Transients 12hrs

Transient response of R-L, R-C, R-L-C circuits for DC, Pulse and AC excitations, Solution using classical methods only

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)

Reference Books:

1. Network Analysis: Van Valkenburg; Prentice-Hall of India Private Ltd.
2. Fundamentals of Electrical Circuits by Charles K. Alexander and Mathew N.O. Sadiku, McGraw Hill Education (India)
3. Electrical Circuit Analysis-2 by A Sudhakar, Shyammohan S Palli, McGraw Hill Education (India)
4. Circuit Theory (Analysis and Synthesis) by A.Chakrabarthi, DhanpatRai&Co.
5. Electric Circuits by David A. Bell, Oxford publications
6. Electric Circuits– (Schaum's outlines) by Mahmood Nahvi& Joseph Edminister, Adapted by K. Uma Rao, 5th Edition – McGraw Hill