NETWORK THEORY AND ANALYSIS

Course Code	20EC3304	Year	II	Semester	I
Course Category	Program core	Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	BEEE
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	**Relate** facts and ideas of network analysis methods to **respond/ find solutions** to simple questions/ problems on different networks (L2)
CO2	**Solve** problems on networks by applying different network analysis techniques (L3)
CO3	**Analyze** networks using methods like mesh analysis, nodal analysis and network theorems to **make inferences/ find evidence** to support solutions/ conclusions (L4)
CO4	**Inspect** the given circuit and situation to find the bandwidth, selectivity and quality factor of a series and parallel resonant circuits (L4)

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3-High, 2:Medium, 1:Low)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	2													
CO2	3							2		2			3	
CO3		3						2		2			3	
CO4		1						3		3			3	
Average* (Rounded to nearest integer)	3	3						2		2			3	

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Sinusoidal Steady-State Analysis:** Sinusoids, sinusoidal functions and complex functions, instantaneous power, average power, effective values of current and voltage, apparent power and power factor, complex power, phasors, phasor relationships for R, L and C and steady state analysis of RL, RC and RLC circuits	CO1,CO2, CO3
II	**Transient Analysis of circuits**: Transient analysis of first order and second order systems, initial and final conditions in networks, dc transients: source free and forced response of RL, RC and RLC circuit analysis using Laplace transform	CO1,CO2, CO3
III	**Network Analysis Methods and Theorems (Application to AC Circuits)**: Ohm's law, Kirchhoff's laws, series and parallel circuits, source transformations, delta-wye conversion, mesh, super mesh analysis, nodal, super node analysis, Linearity and superposition	CO1,CO2, CO3

	theorem, Thevenin's and Norton's theorems, maximum power transfer theorem	
V	**Two Port Networks:** Impedance parameters, admittance Parameters, hybrid parameters and transmission parameters, relationships among parameters	CO1,CO2, CO3
V	**Resonance**: Series resonance, parallel resonance, bandwidth, selectivity, quality factor	CO1,CO2, CO4

Learning Resources
Text Books
1. M. E.Van Valkenburg, Network Analysis, III Edition, Pearson Education 2. A. Sudhakar and Shyammohan S. Palli, Circuits and Networks, 5th Edition, McGraw Hill
Reference Books
1. William H. Hayt, Jack E. Kimmerly and Steven M. Durbin, Engineering Circuit Analysis, 8th Edition, Tata McGraw Hill 2. Ravish R.Singh, Network Analysis and Synthesis, First Edition, Tata McGraw Hill (India), NewDelhi
e-Resources & other digital material
1. https://www.youtube.com/playlist?list=PLC7D3EAEFA0CC0420&app=desktop 2. https://www.tutorialspoint.com/network_theory/network_theory_quick_guide.htm 3. https://nptel.ac.in/courses/108/105/108105159/
