CIRCUIT ANALYSIS

Course Code	20EC5601	**Year**	III	**Semester**	II
Course Category	MINORS	**Branch**	ECE	**Course Type**	Theory
Credits	4	**L-T-P**	3-1-0	**Prerequisites**	
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	Understand active and passive elements used in electrical 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									2		2		2
CO2	3									3				2
CO3		3								3				2
CO4		2								2				1
Average* (Rounded to nearest integer)	3	3								3				2

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Introduction to Electrical Circuits:** Basic Concepts of active and passive elements and their V-I relations, Ohm's Law, Sources (dependent and independent), Kirchhoff's laws– Resistors in series and parallel circuits– Mesh current and node voltage method of analysis for D.C circuits.	CO1- CO3
II	**Network Reduction and Network Theorems for DC Circuits:** Network reduction techniques (series, parallel, series - parallel, star-to-delta and delta-to-star transformation), source transformation technique, nodal analysis and mesh analysis, Super node and Super mesh analysis, Thevenin's and Norton's theorems – Superposition theorem–Maximum power transfer theorem–Reciprocity Theorem.	CO1-CO3

III	**Sinusoidal Steady-State Analysis:** Periodic waveforms (determination of RMS, average value, peak factor and form factor), concept of phase angle, phase difference – waveforms and phasor diagrams, rectangular and polar forms of representations, power factor, real, reactive and apparent power.	CO1- CO3
IV	**Resonance and Coupled circuits:** Series and parallel resonance, the frequency response–Quality factor and Bandwidth	CO1-CO4
V	**Two port Networks Analysis:** Open circuit Impedance & Short circuit Admittance parameter, Transmission parameters, Hybrid parameters and their inter relations.	CO1,CO2, CO4

Learning Resources
Text Books
1. W. Hayt and Jack E.Kemmerley -Engineering Circuit Analysis, McGraw Hill Company, 6th Ed. 2. Van Valkenburg - Network Analysis; Prentice-Hall of India Private Ltd.
Reference Books
1. C. K. Alexander and Mathew N.O. Sadiku-Fundamentals of Electrical Circuits, Mc.Graw Hill Education. 2. Carlo, Lin, Linear Circuit Analysis, Oxford publications. 3. M. Nahvi & J.Edminister, Electric Circuits – (Schaum's outlines) 5th Ed., McGraw Hill. 4. David A. Bell, Electric Circuits, Oxford publications.
e-Resources
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/