SRM UNIVERSITY
Faculty of Engineering and Technology

DEPARTMENT OF ICE

Course Code, Title : IC0207/EI0207, Electric circuits and Networks
Year& Semester : II & III semester

Faculty Details:

Name of the staff	Section	Staff room	Office Hours	Mail ID
Y.Jeyashree	ICE 'A'	Tech park 14th floor	8.30a.m-4p.m	jeyashree.y@ktr.srmuniv.ac.in

Required Text Books:

1. Hayt & Kemmerley, Engineering circuit Analysis, Tata Mcgraw Hill, 1993. (R1)
2. Sudhahar, A. and Shyam Mohan. S.P, Circuits and Networks Analysis and systhesis, Tata Mcgraw Hill Publishing Co.Ltd. New Delhi 1994.(R2)
3. Arumugam & Prem Kumar, Electric circuit Theory, Khanna Publishers.2002.(R3)
4. Soni & Gupta, A course in Electric circuits Analysis, Dhanpat Rai & Sons, 1992. (R4)

Web Resource:

- http://www.allaboutcircuits.com/
- http://www.circuit-magic.com/laws.htm
- http://www.brighthub.com/

Prerequisite : IC0207/EI0207 Electric Circuits & Networks

Objective:

1. Introduction to dependant and independent voltage and current sources.
2. To acquire the skills in analyzing simple series and parallel circuits.
3. To implement nodal, mesh, supernodes and supermeshes analysis for various circuits.
4. To analyze DC circuits using Super mesh & Super nodal analysis employing KCL and KVL.
5. To analyze complicated DC circuits using various Network theorems.
6. To learn the steady state analysis for RLC circuits with AC supply.
7. To understand self and mutual Inductance and to properly apply the dot rule for magnetically coupled circuits.
8. To understand the time domain and frequency domain analysis of RLC networks for DC and sinusoidal excitation.
9. To learn the distinction between one port and two port networks and to perform circuit analysis using network parameters.

Assessment details

Cycle Test-I	10 marks
Cycle Test-II	10 marks
ClassTest	5 marks
Model Exam	20 marks
Attendance	5 marks
Total	50 marks

Outcomes

Students who have successfully completed this course

Course outcome	Program outcome
• Familiar with Kirchhoff's laws and their application with simple series and parallel resistive circuits. • Familiar with nodal, mesh, supernodes and supermeshes analysis for various circuits. • Familiar with DC circuits using Super mesh & Super nodal analysis employing KCL and KVL. • The Thevinin and Norton Equivalent for any network can be determined. • Familiar with the steady state analysis for RLC circuits with AC supply. • Familiar with self and mutual Inductance and to properly apply the dot rule for magnetically coupled circuits. •) ˚æ ŁŁ˚ß¾Ö Ł¬ª calculation of natural and forced responses for RLC network. •) ˚æ ŁŁ˚ß¾Ö Ł¬ª the distinction between one port and two port networks and to perform circuit analysis using network parameters.	**a:** The student will be able to work on technical design aspects of various engineering problems. **b**: The student will be able to analyze voltages, currents and powers using basic laws and theorems in DC and AC circuts.. **c:** Students should be able to apply basic knowledge in electronics, electrical circuit analysis, electrical machines. d: Students should be able to apply basic mathematical, scientific, and engineering concepts to technical problem solving.

Detailed Session Plan

Hour	Topics to be covered	Reference
1	Ideal sources – Dependent and Independent sources	R1,R2, R3
2	KCL and KVL	R1,R2, R3
3	• Analysis of complex circuits using mesh method	R1,R2, R3
4	• Analysis of complex circuits using mesh method	R1,R2, R3
5	• Analysis of complex circuits using node method	R1,R2, R3
6	• Analysis of complex circuits using	R1,R2, R3

	node method	
7	• Super mesh analysis	R1,R2, R3
8	• Super node analysis	R1,R2, R3
9	• Star-Delta transformation	R1,R2, R3
10	• Thevenin's Theorem	R1,R2, R3
11	• Thevenin's Theorem	R1,R2, R3
12	• Norton's Theorem	R1,R2, R3
13	• Super position Theorem	R1,R2, R3
14	• Super position Theorem	R1,R2, R3
15	• Maximum power transfer theorem	R1,R2, R3
16	• compensation Theorem	R1,R2, R3
17	• Reciprocity theorem	R1,R2, R3
18	• Millman's theorem, Tellegen's theorem- Statement, illustration	R1,R2, R3
19	• Voltage, Current relationship, power & power factor of R, L and C Circuits	R1,R2, R3
20	• Voltage, Current relationship, power & power factor of RL and RC circuits	R1,R2, R3
21	• Voltage, Current relationship, power & power factor of RLC circuits.	R1,R2, R3
22	• Series resonance, Q factor and Bandwidth	R1,R2, R3
23	• Parallel resonance, Q factor and Bandwidth	R1,R2, R3
24	• Self Inductance	R1,R2, R3
25	• Mutual Inductance	R1,R2, R3
26	• Coefficient of coupling –dot rule	R1,R2, R3
27	• Effective inductance of coupled coils in series & in parallel	R1,R2, R3
28	• Concept of complex frequency	R4
29	• Network functions- Poles and Zeros	R1,R2, R3
30	• Representation of network elements in time domain & frequency domain	R1,R2, R3
31	• Free & forced responses of RL with DC excitation	R1,R2, R3
32	• Free & forced responses of RC with DC excitation	R1,R2, R3
33	• Free & forced responses of RLC with DC excitation	R1,R2, R3
34	• Free & forced responses of RL with sinusoidal excitation	R1,R2, R3
35	• Free & forced responses of RC with sinusoidal excitation	R1,R2, R3
36	• Free & forced responses of RLC with sinusoidal excitation	R1,R2, R3
37	• Definitions of driving point and transfer immittance function of two port networks	R1,R2, R3

38	• Two port Parameters: z parameters	R1,R2, R3
39	• Two port Parameters: y parameters	R1,R2, R3
40	• Two port Parameters: h parameters	R1,R2, R3
41	• Two port Parameters: inverse h parameters	R1,R2, R3
42	• Two port Parameters: ABCD parameters	R1,R2, R3
43	• Two port Parameters: Transmission parameters	R1,R2, R3
44	• Relationship between the different parameters.	R1,R2, R3
45	• Relationship between the different parameters.	R1,R2, R3