

Course No.	Course Name	L-T-P -Credits	Year of Introduction
EE201	CIRCUITS AND NETWORKS	3-1-0-4	2016

Prerequisite: Nil

Course Objectives:

To learn about various techniques available to solve various types of circuits and networks
To gain the capability to synthesize a circuit for a particular purpose.

Syllabus AC Circuit Analysis(Steady State AC Analysis), Network topology, Transient analysis,
Laplace transform– properties , Transformed circuits, Two port networks, Symmetrical two port reactive networks as filters, Network functions, Network Synthesis

Expected outcome.

- Ability to solve any DC and AC circuits
- Ability to apply graph theory in solving networks
- Ability to apply Laplace Transform to find transient response
- Ability to synthesize networks

Text Book:

1. Hayt and Kemmerly :Engineering Circuit Analysis, 8e, Mc Graw Hill Education , New Delhi, 2013.
2. Sudhakar and Shyam Mohan- Circuits and Networks: Analysis and Synthesis, 5e, Mc Graw Hill Education,

Data Book (Approved for use in the examination): Nil

References:

1. Siskand C.S : Electrical Circuits ,McGraw Hill
2. Joseph. A. Edminister: Theory and problems of Electric circuits, TMH
3. D Roy Chaudhuri: Networks and Systems, New Age Publishers
4. A . Chakrabarti : Circuit Theory (Analysis and Synthesis),Dhanpat Rai &Co
5. Valkenberg : Network Analysis ,Prentice Hall of India
6. B.R. Gupta: Network Systems and Analysis, S.Chand & Company ltd

Course Plan

Module	Contents	Hours	End Sem. Exam Marks
I	Network theorems – Superposition theorem – Thevenin’s theorem – Norton’s theorem – Reciprocity Theorem – Maximum power transfer theorem – dc and ac steady state analysis – dependent and independent sources	9 hours	15%
II	Network topology – graph, tree, incidence matrix – properties of incidence matrix – fundamental cut sets – cut set matrix – tie sets – fundamental tie sets – tie set matrix – relationships among incidence matrix, cut set matrix & tie set matrix – Kirchoff’s laws in terms of network topological matrices – formulation and solution of network equations using topological methods	9 hours	15%

FIRST INTERNAL EXAMINATION			
III	Steady state and transient response – DC response & sinusoidal response of RL, RC and RLC series circuits	9 hours	15%
IV	Application of Laplace transform in transient analysis – RL, RC and RLC circuits (Series and Parallel circuits) – step and sinusoidal response Transformed circuits – coupled circuits - dot convention - transform impedance/admittance of RLC circuits with mutual coupling – mesh analysis and node analysis of transformed circuits – solution of transformed circuits including mutually coupled circuits in s-domain	10 hours	15%
SECOND INTERNAL EXAMINATION			
V	Two port networks – Z, Y , h, T parameters – relationship between parameter sets – condition for symmetry & reciprocity – interconnections of two port networks – driving point and transfer immittance – T- π transformation.	9 hours	20%
VI	Network functions–Network synthesis-positive real functions and Hurwitz polynomial-synthesis of one port network with two kinds of elements-Foster form I&II-Cauer form I&II.	8 hours	20%
END SEMESTER EXAM			

QUESTION PAPER PATTERN (End semester exam)

Part A: 8 questions.

One question from each module of Module I - IV; and two each from Module V & VI.
Student has to answer all questions. (8 x 5)=40

Part B: 3 questions uniformly covering modules I&II

Student has to answer any 2 questions: (2 x 10) =20

Part C: 3 questions uniformly covering modules III&IV

Student has to answer any 2 questions: (2 x 10) =20

Part D: 3 questions uniformly covering modules V&VI

Student has to answer any 2 questions: (2 x 10) =20

Note: Each question can have maximum of 4 sub questions, if needed.