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 x5)=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.