

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.