

Road Map to the Syllabus

(Effective from August 2007)

Jawaharlal Nehru Technological University, Hyderabad Network Analysis

Unit 1: Introduction to Electrical Circuits

Circuit Concept – R-L-C parameters-Voltage and Current sources-Independent and dependent sources - Source transformation - Voltage - Current relationship for passive elements - Kirchoff's laws - network reduction techniques - series, parallel, series parallel, star-to-delta or delta-to-star transformation.

Go To CHAPTER 1 — INTRODUCTION TO ELECTRIC CIRCUITS

Unit 2: A.C Circuits - I

R.M.S and Average values and form factor for different periodic wave forms, Steady state analysis of R, L and C (in series, parallel and series parallel combinations)with sinusoidal excitation- Concept of self and mutual inductances-co-efficient of coupling series circuit analysis with mutual inductance.

Go To CHAPTER 2 — AC CIRCUITS I

Unit 3: A.C Circuits-II

Resonance - series, parallel circuits, concept of band width and Q factor. Three phase circuits: Phase sequence - Star and delta connection - Relation between line and phase voltages and currents in balanced systems - Calculations of active and reactive power.

Go To CHAPTER 3 — AC CIRCUITS II



Unit 4: Network topology

Definitions - Graph - Tree, Basic cutset and Basic Tieset matrices for planar networks - Loop and Nodal methods of analysis of Networks with independent and dependent voltage and current sources - Duality & Dual networks.

Go To CHAPTER 4 — NETWORK TOPOLOGY

Unit 5: Network Theorems

Tellegens, Superposition, Reciprocity, Thevinin's, Norton's, Max Power Transfer theorem. Milliman's Therorem – Statement and proofs problem solving using dependent and independent sources for dc and ac excitation.

Go To CHAPTER 5 — NETWORK THEOREMS

Unit 6: Two port Networks

Z, Y, ABCD, h-parameters – Conversion of one parameter to another parameter – condition for reciprocity and symmetry – 2 port network connections in series, parallel and cascaded – problem solving.

Go To CHAPTER 6 — TWO-PORT NETWORKS

Unit 7: Transient Analysis

Transient response of R-L, R-C, R-L-C circuits (Series combination only) for d.c. and sinusoidal excitations – initial conditions – Solution using differential equation approach and Laplace transform methods of solutions.

Go To CHAPTER 7 — TRANSIENT ANALYSIS

Unit 8: Filters

L.P, H.P, B.P, B.E, Prototype filters design - M-derived filters of L.P. and H.P.- Composite filter design of L.P. and H.P design of various symmetrical attenuators.

Go To CHAPTER 8 — FILTERS AND ATTENUATORS