



Computer Engineering Department, NIT Surat, INDIA

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SVNIT

B.Tech. II (CO) Semester - 3

L T P C

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EE207 : ELECTRICAL NETWORK ANALYSIS (IS-II)

3 0 0 3

<http://www.svnit.ac.in>

Faculty

COURSE OUTCOMES

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After successful completion of this course, student will be able to

- Apply basic laws to analyze various circuits in time domain as well as frequency domain.
- Analyze the component behaviour under steady state and transient conditions.

Moodle

<http://172.16.1.10/moodle>

COURSE CONTENT

• Network Concepts (04 Hours)

Network element symbols and conventions; Active element conventions; current and voltage conventions; loops and meshes; Nodes; coupled circuits and Dot conventions.

• Mesh current and node voltage network analysis (06 Hours)

Definitions of mesh currents and nodal voltages; Choice of mesh currents or nodal voltages for setting up operating equations necessary for network analysis. Self and mutual inductances. Setting up network equations by inspection in impedance or admittance matrix forms.

• Network Theorems (07 Hours)

Linearity and superposition; Independent and dependent sources and their transformations; Thevenin's, Norton's, and maximum power transfer theorems. Use of these theorems in circuit analysis; Duality and dual of a planner network.

• Topics in Time-domain and frequency domain (06 Hours)

Laplace transforms, unit step function; other unit functions, the impulse, ramp and doublet; the Laplace transforms for shifted and singular functions; the convolution integral.

• Circuit Transients (06 Hours)

D.C. and A.C. transients of R-L, R-C, R-L-C, and two mesh transient analysis using Laplace transform method; Initial and Final value theorems and their applications for s-domain circuits.

• Wave form analysis by Fourier Series (06 Hours)

Trigonometric and complex exponential forms; the frequency spectra of periodic wave forms; the Fourier Integral and continuous frequency spectra; Fourier transform and their relationship with Laplace transform.

• Network Functions and Two port parameters (07 Hours)

Poles and zeros of a function, physical and analytical concepts, Terminal and terminal pairs, Driving point immittances, transfer functions, Definitions, calculations and interrelationship of impedance, admittance, hybrid and transmission line parameters for four terminal networks. Image impedance and its calculations for symmetrical and unsymmetrical p, T and Ladder Networks.

(Total Contact Time: 42 Hours)

BOOKS RECOMMENDED

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- 1). W.H.Hyat, J.E.Kemmerly, S.M.Durbin, "Engineering Circuit Analysis" 6/E, TMH, 2006.
 - 2). Joseph A Edminister, "Electric Circuits", SI (metric) ed, Schaum's outline series, MGH, 1965
 - 3). Van Valkenburg, "Network Analysis", M E, 3/E, PHI, 2002.
 - 4). Samarjit Ghosh, "Network Theory", Analysis & Synthesis, PHI, 2005.
 - 5). C.L.Wadhwa, "Network Analysis & Synthesis", Revised 3/E, New Age International Pub, 2007.