COURSE STRUCTURE OF B. TECH IN
COMPUTER SCIENCE & ENGINEERING, HIT

Course Name : Circuit Theory					
Course Code: ELEC3001					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit points**
	3	1	0	4	4

Total: 40L

Module-I
Network equations: Formulation of Node & Mesh equations. Loop and node variable analysis. Network Theorems: Thevenin's, Norton's and Superposition theorem applied to circuits containing dependent sources.

[10L]

Module-II
Laplace Transform: Review of Laplace transform. Properties of Laplace transform. Transform of standard periodic and non periodic waveforms. Circuit elements and their transformed equivalents. Transient and steady state response of RL, RC, LC and RLC with or without stored energy. Concept of natural frequency and damping. Sketching transient response, determination of time domain specifications.

[10L]

Module-III
SPICE: Structure of a SPICE program, active and passive device/element statements, different study like DC analysis, transient analysis and ac analysis statement in SPICE. Plotting and printing statement, input and output Impedance calculation using SPICE, voltage and current controlled components in SPICE.

[5L]

Graph theory: Graph of network: Concept of path, tree, tree branch, tree link, loop, tie set and cut set. Incidence Matrix, tie-set Matrix and f-cut set matrix and their properties. Loop currents and node-pair potentials, formulation of loop and node equilibrium equations in view of graph theory.

[5L]

Module-IV
Two port networks: Open circuit Impedance & Short circuit Admittance parameter, Transmission parameters and Hybrid parameters. Inter relation between parameters. Inter connection between two port networks. Driving point & transfer impedance & admittance.

[5L]

Filter Circuits: Concept of filters, Classification of filters. Analysis of Low pass, High pass, Band pass and Band reject filters using operational amplifier.

[5L]

Text Books:
1. Networks and Systems, D. Roy Chowdhury, New Age International Publishers
2. Circuit theory, Dr. Abhijit Chakrabarty, Dhanpat Rai & Co Pvt. Ltd.
3. Network Analysis, Van Valkenburg, Pearson Education .
4. Fundamental of Electric circuit theory, D. Chattopadhay & P.C. Rakshit, S. Chand.

References:
1. Engineering Circuit Analysis, W.H. Hyat, J.E. Kemmerly & S.M. Durbin,The Mc Graw Hill Company.
2. Modern Network Analysis, F.M.Reza & S.Seely, McGraw Hill.