Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous Institute Affiliated to University of Mumbai)

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		L	T	P	L	T	P	Total
ETL45	Computer Methods for Circuit Simulation Lab	--	--	2	--	--	1	1
		Examination Scheme						
		ISE			ESE			Total
					Practical		Oral	
		40			--		20	60

Pre-requisite Course Codes		Programming in C BS31 (Applied Mathematics I) ET32 (Circuit theory)
After successful completion of the course, student will be able to		
Course Outcomes	CO1	Illustrate a network in terms algebraic equations
	CO2	Apply Numerical techniques to solve linear and non linear algebraic equations
	CO3	Perform DC and Transient analysis on Electrical networks
	CO4	Analyze the given circuit using Monte Carlo

Exp. No.	Experiment Details	Ref.	Marks
1	Formulation of Linear algebraic Equations for Network using Modified Nodal Analysis and Apply Gaussian Elimination and L U decomposition methods for Solution	1,3,4	5
2	Apply Indirect methods (Gauss-Seidel and Gauss Jacobi) to find Solution of Linear algebraic Circuit Equation	1,3,4	5
3	Formulation of Non-Linear algebraic Equations for Network and Applying Newton – Raphson method to solve them	2,3,4	5
4	Applying Newton – Raphson method for solving a MOSFET based Non-Linear algebraic Circuit Equations	1,3,4	5
5	Transient simulation using Forward Eular, Backward Eular and Trapezoidal method. Verification of Stability in each method.	2,3,4	5
6	Solution of differential circuit equations using linear multistep methods	1,3,4	5
7	Solution of differential circuit equations using trapezoidal ringing	1,3,4	5
8	Perform Monte-Carlo Analysis on given circuit	1,2,3,4	5
		Total Marks	40

References:

[1] F. N. Najm, *Circuit Simulation*, Wiley-IEEE Press, 2010

[2] M.B. Patil, V. Ramanarayanan, V. T. Ranganathan, *Simulation of Power Electronic Circuits*, Narosa

[3] E. Balagurusamy, *Numerical Methods*, TATA McGRAW HILL

[4] R. Raghuram, *Computer Simulation of Electronic Circuits*, New Age International