

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	Т	Р	L	Т	Р	Total
ELL46	Computer Methods for Circuit Simulation Lab			2			1	1
		Examination Scheme						
		ISE			ESE			Total
					Prac	tical	Oral	
		40				20	60	

			Programming in C
Pre-requisite Course Codes		se Codes	BS31 (Mathematics)
			EL32 (Circuit theory)
After successful completion of the course, student will be able to			
	CO1	Illustrate a network in terms algebraic equations	
Course	CO2	Apply Numerical techniques to solve linear and non linear algebraic equations	
Outcomes	CO3	Perform DC and Transient analysis on Electrical networks	
	CO4	Analyze th	ne given circuit using Monte Carlo

Exp. No.	Experiment Details	Ref.	Marks	
1	Formulation of Linear algebraic Equations for Network using Modified	1,3,4	5	
	Nodal Analysis and Apply Gaussian Elimination and L U			
	decomposition methods for Solution			
2	Apply Indirect methods (Gauss-Seidel and Gauss Jacobi) to find	1,3,4	5	
	Solution of Linear algebraic Circuit Equation			
3	Formulation of Non-Linear algebraic Equations for Network and	2,3,4	5	
	Applying Newton – Raphson method to solve them			
4	Applying Newton - Raphson method for solving a MOSFET based	1,3,4	5	
	Non-Linear algebraic Circuit Equations			
5	Transient simulation using Forward Eular, Backward Eular and	2,3,4	5	
	Trapezoidal method. Verification of Stability in each method.			
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				

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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