

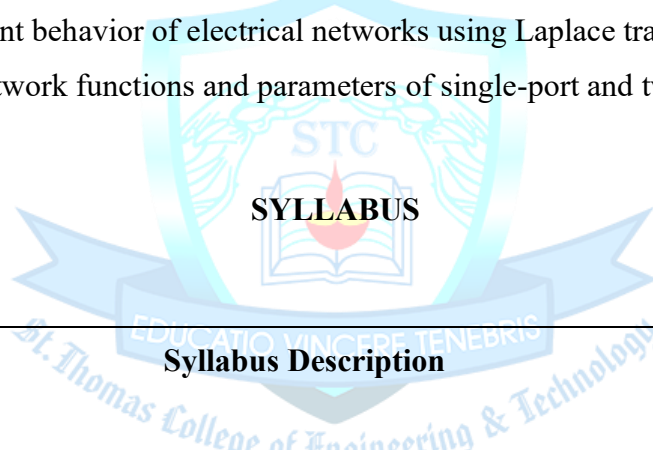
SEMESTER S2

NETWORK THEORY

Course Code	NWT205	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:1:0:0	ESE Marks	60
Credits	4	Exam Hours	2 Hrs. 30 Min
Prerequisites (if any)	None	Course Type	Theory

Course Objectives:

- 1 To analyze electrical networks using Mesh / Nodal methods /network theorems
2. To analyze transient behavior of electrical networks using Laplace transform
3. To identify the network functions and parameters of single-port and two-port networks..



Module No.	Syllabus Description	Contact Hours
1	Network fundamentals and analysis methods: Concept of networks and circuits, Circuit variables, Ideal and practical sources, Independent and dependent sources, Source transformation, Kirchhoff's laws. Mesh analysis, Node analysis, Super-mesh analysis and super-node analysis applied to both DC and AC networks containing independent and dependent sources.	11
2	Network theorems and applications: Superposition theorem, Reciprocity theorem, Thevenin's theorem, Norton's theorem, Millman's theorem and Maximum power transfer theorem for the analysis of DC and AC networks having independent and dependent sources.	11

3	<p>Laplace transforms and transient analysis: Laplace transforms of standard signals and common functions, Laplace transform theorems (proof not required), Inverse Laplace transforms, Solution of differential equations.</p> <p>Transformation of basic signals and circuits to s – domain with and without initial conditions. Transient analysis of RL, RC and RLC networks with DC, impulse, step and sinusoidal inputs. Analysis of low pass and high pass RC circuits using Laplace transforms.</p>	11
4	<p>Network functions and two-port parameters: Network functions for single-port and two-port networks, Properties of driving point and transfer functions, Significance of poles and zeros of network functions, Pole-zero plot. Impedance, Admittance, Hybrid and Transmission parameters of two port networks, Reciprocity and symmetry conditions (derivation not required), Inter-relationships between parameters, Series and parallel connections of two-port networks.</p>	11

Course Assessment Method

(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Micro project	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	15	10	10	40

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
<ul style="list-style-type: none">2 Questions from each module.Total of 8 Questions, each carrying 3 marks <p>(8x3 =24marks)</p>	<ul style="list-style-type: none">Each question carries 9 marks.Two questions will be given from each module, out of which 1 question should be answered.Each question can have a maximum of 3 subdivisions. <p>(4x9 = 36 marks)</p>	60

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Analyze electrical networks using mesh and node methods	K4
CO2	Apply network theorems to analyze electrical networks	K3
CO3	Analyze transient behavior of electrical networks using Laplace transforms	K4
CO4	Identify the network functions and parameters of single-port and two port networks	K2

Note: K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create

CO-PO Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3		2	1						2
CO2	3	3	1		1						2
CO3	3	3		2	1						2
CO4	2	2			1						2

Note: 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation

Text Books				
Sl No.	Title of the book	Name of the Author/s	Name of the Publisher	Edition and Year
1	Basic Engineering Circuit Analysis	R. Mark Nelms, J. David	Irwin Wiley	12/e, 2020
2	Network Analysis and Synthesis	Franklin F. Kuo	Wiley	2/e, 2012
3	Circuits and Networks- Analysis and Synthesis	Sudhakar A and Shyammohan S. P	McGraw Hill	5/e, 2015
4	Network Analysis	Van Valkenburg M.E	Prentice Hall India	Revised 3/e,2019

Reference Books				
Sl No.	Title of the book	Name of the Author/s	Name of the Publisher	Edition and Year
1	Circuit Theory Analysis and Synthesis	Abhijit Chakrabarti	Dhanpat Rai & Co.	Revised 7/e, 2018

2	Electric Circuits – Schaum's Outline Series	Joseph A. Edminister, K.Rao and M. Nahvi	McGraw-Hill	5/e, 2017
3	Electric Circuits and Networks	K. S. Suresh Kumar	Pearson	2008
4	Network analysis and synthesis	Ravish R	McGraw-Hil	2/e,2015

