

**PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY**  
**Department of Electronics & Communication Engineering**

**LESSON PLAN**

**Subject Name: - Network Theory**  
**Year: 2<sup>nd</sup>**

**Subject Code: - EC-213A**  
**Semester: - 3<sup>rd</sup>**

<b>Lecture No</b>	<b>Unit No</b>	<b>Topic</b>	<b>References</b>
1	-	Introduction to Subject, Introduction to basic circuit elements	Fundamentals of Electric Circuits: Charles K. Alexander
2	-	KCl , KVL with their numerical problems	
3	-	Numerical problems based on Nodal and Mesh analysis	
4	-	Introduction to Laplace transform	
5	3	<b>Unit:3 Characteristics and Parameters of Two Port Networks:</b> Relationship of two-port variables, open circuit impedance parameters	
6	3	Short-Circuit admittance Parameters	
7	3	Numerical based on Z and Y parameters	
8	3	Transmission parameters	
9	3	Hybrid parameters	
10	3	Relationships between parameter sets	
11	3	Relationships between parameter sets	
12	3	Inter-connection of two port networks	
13	3	Inter-connection of two port networks	
14	4	<b>Unit: 4 Types of Filters and their Characteristics:</b> Filter fundamentals	Network Analysis & Synthesis: F. F. Kuo
15	4	Constant-k low pass filters	

16	4	Constant-k high-pass filters.	
17	4	m-derived low-pass filters	
18	4	m-derived high -pass filters	
19	4	<b>Network Synthesis:</b> Causality & Stability, Hurwitz Polynomials	
20	4	Positive real functions	
21	4	Synthesis of one port networks with two kinds of elements.	
22	4	Synthesis of one port networks with two kinds of elements.	
23	4	Synthesis of one port networks with two kinds of elements.	
24	1	<b>Unit –I</b> Principles of network topology	Network Analysis: M.E. Van Valkenburg, PHI
25	1	Principles of network topology	
26	1	Graph Matrices	
27	1	Graph Matrices	
28	1	Network Analysis (Time-Domain): Singularity Functions, Source-Free RC, RL	Fundamentals of Electric Circuits: Charles K. Alexander
29	1	Series RLC, Parallel RLC circuits, Initial & Final Conditions	
30	1	Impulse & Step Response of RC	
31	1	Impulse & Step Response of RL	
32	1	Impulse & Step Response of Series RLC	
33	1	Impulse & Step Response of Parallel RLC circuits.	
34	2	<b>Unit-II Network Analysis (using Laplace Transform):</b> Circuit Element Models, Transient Response of RC to various excitation signals such as step, ramp	Network Analysis: M.E. Van Valkenburg, PHI

35	2	Transient Response of RC to various excitation signals such, impulse and sinusoidal excitations using Laplace transform.
36	2	Transient Response of RC to various excitation signals such, impulse and sinusoidal excitations using Laplace transform.
37	2	Transient Response of RL to various excitation signals such as step
38	2	Transient Response of RL to various excitation signals such as step
39	2	Transient Response of RLC to various excitation signals such as step
40	2	Transient Response of RLC to various excitation signals such as step
41	2	<b>Network Functions:</b> Terminal pairs or Ports, Network functions for one-port and two-port networks
42	2	Poles and zeros of Network functions,
43	2	Time domain behavior from the pole and zero plot
44	2	Restrictions on pole and zero Locations for driving point functions
45	2	Restrictions on pole and zero Locations for transfer functions.

**TEXT BOOKS:**

1. Fundamentals of Electric Circuits: Charles K. Alexander, Matthew N. O. Sadiku, McGraw Hill Education
2. Network Analysis: M.E. Van Valkenburg, PHI

**REFERENCE BOOKS:**

1. Network Analysis & Synthesis: F. F. Kuo, John Wiley.
2. Circuits & Networks: Sukhija & Nagsarkar, Oxford Higher Education.
3. Basic Circuit Theory: DasoerKuh, McGraw Hill Education.
4. Circuit Analysis: G.K. Mithal, Khanna Publication.