Programme	**:**	**Diploma in ET**/CE/EE//ME/MT/CM/IT/DDGM
Programme Code	**:**	01/02/**03**/04/05/06/07/08/21/22/**23**/24/26/16/**17**
Name of Course	**:**	**Network Analysis**
Course Code	**:**	**ET 382**

Teaching Scheme:

	Hours /Week	**Total Hours**
Theory	**03**	**48**
Practical	**02**	**32**
Tutorial	**01**	**16**

Evaluation Scheme:

	Progressive Assessment	**Semester End Examination**			
		Theory	**Practical**	**Oral**	**Term work**
Duration	**Two class tests, each of 60 minutes**	**3 Hrs.**	**3 Hrs.**	**--**	**--**
Marks	**20**	**80**	**25**	**--**	**--**

Course Rationale:

To familiarize the students with the basic laws, definitions and theorems used in analysis of electrical and electronic circuits.

Course Objectives:

After studying this course, the student will be able to

- Understand the basic laws & definitions and theorems used in circuit's analysis,
- Be able to analyze the circuits,
- Appreciate the working of the circuits as a filter, resonant circuits, attenuators and equalizers
- Understand the use of P-Spice in circuit analysis

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
1.	**Circuit Analysis: - Laws & Definition**		
	1.1 Kirchhoff's Laws. 1.2 Calculation of Voltage, Current & Power in Series & Parallel components. 1.3 Types of Sources. 1.4 V-I relations of R, L & C. 1.5 Voltage & Current divider principles. 1.6 Star to delta & delta to star Transformations. 1.7 Source Transformations. 1.8 Characteristics impedance. 1.9 Types of Network Elements - (Only Definitions) Active / Passive, Unilateral / Bilateral, Lumped / Distributed, Linear / Nonlinear Elements	**08**	**10**
2.	**Mesh & nodal Analysis**		
	2.1 Mesh analysis-concept and numerical 2.2 Nodal analysis- concept and numerical 2.3 Duality-concept, Principle ,Numerical	**09**	**14**
3.	**Two port Network**		
	3.1 Impendance (Z) parameters 3.2 Admittance (Y) parameters 3.3 Hybrid parameters 3.4 Transmission (ABCD) parameters 3.5 Interrelationship between Z and Y parameters	**08**	**12**
4.	**Theorems**		
	Statement, explanation and Numerical on- 4.1 Superposition theorem 4.2 Thevenin's theorem 4.3 Norton's theorem 4.4 Maximum Power transfer theorem 4.5 Reciprocity theorem 4.6 Millman's Theorem	**09**	**16**
5.	**Resonant Circuits**		
	5.1 Series resonant circuits- Expression for the resonant frequency, effect of Q on bandwidth, relation between Fr, Q and BW. 5.2 parallel resonant circuits- Expression for the resonant frequency, effect of Q on bandwidth, relation between Fr, Q and BW. 5.2 Voltage magnification factor, Q- factor, Bandwidth.	**04**	**08**
6.	**Filters and attenuators**		
	6.1Definition, Types ,need, applications of filter 6.2Constant-K type High pass, 6.3Constant-K type low pass, 6.4Constant-K type band pass,	**06**	**12**

	6.5Constant-K type Band rejects filters. 6.6Attenuators Equalizers - Definition,Types, applications.		
7.	**Transmission Line**		
	7.1 Fundamentals of transmission line 7.2General equivalent circuit of transmission line 7.3Characteristic impedance 7.4losses in transmission line 7.5 standing waves 7.6 transmission line components, stub and baluns.	**04**	**08**
	TOTAL	**48**	**80**

List of Practical/Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment
1.	Verification of KCL
2.	Verification of KVL.
3.	Measurement of Node voltages.
4.	Measurement of loop currents.
5.	Calculate Z Parameters of two ports Network
6.	Calculate Y Parameters of two ports Network
7.	To verify Super position theorem
8.	To verify Thevenin's Theorem
9.	To verify Maximum Power Transfer theorem
10.	To plot frequency response of Series resonance circuit.
11.	To plot frequency response of parallel resonance circuit.
12.	Study of Low pass filter Characteristic
13.	Study of High pass filter Characteristic
14.	Observe standing waves of a transmission line.

Minimum 12 Experiments should be performed.

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Circuit analysis	Classroom teaching & Laboratory work
2.	Mesh & Nodal Analysis	Classroom teaching & Laboratory work
3.	Two port network	Classroom teaching & Laboratory work
4.	Theorems	Classroom teaching & Laboratory work
5.	Resonant circuits	Classroom teaching & Laboratory work
6.	Filters	Classroom teaching & Laboratory work
7.	Transmission Line	Classroom teaching & Laboratory work

Text Books:

Sr. No	Author	Title	Publication
1.	Shyammohan S. Palli	Circuits & Networks Analysis and Synthesis	Tata McGraw Hill
2.	John Ryder	Network analysis	Tata McGraw Hill
3.	Sudhakar	Circuits & Networks Analysis	

Reference Books:

Sr. No	Author	Title	Publication
1	Chatopadhyay	Electrical circuits	Tata McGraw hill
2.	Umesh Sinha	Network Analysis	Sinha publications

Learning Resources:

Reference Books, Manuals and Journals

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