Network Analysis Lab

Course Code	23EC3251	**Year**	I	**Semester**	II
Course Category	Program Core	**Branch**	ECE	**Course Type**	Lab
Credits	1.5	**L-T-P**	0-0-3	**Prerequisites**	Nil
Continuous Internal Evaluation:	30	**Semester End Evaluation:**	70	**Total Marks:**	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		BL
CO1	**Verify** Kirchhoff's laws and network theorems and measure signal parameters.	L2
CO2	**Measure** time constants of RL & RC circuits.	L3
CO3	Analyze behavior of RLC circuit for different cases.	L4
CO4	**Design** resonant circuit for given specifications.	L4
CO5	**Characterize** and model the network in terms of all network parameters.	L4
CO6	Communicate concepts and technologies related to network analysis lab effectively in written reports.	L3

Mapping of course outcomes with Program outcomes (CO/PO/PSO Matrix)

Note:1-Weak correlation 2-Medium correlation 3-Strong correlation

*-Average value indicates course correlation strength with mapped PO

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
CO1	3				3			1				1	1
CO2		2			2			1				1	1
CO3		1			1			1				1	1
CO4		1			1			1				1	1
CO5		2			2			1				1	1
CO6									3				
Average	**3**	**2**			**2**			**1**	**3**			**1**	**1**

Syllabus		
Expt. No.	**Contents**	**Mapped CO**
1	Study of components of a circuit and verification of KCL and KVL	CO-1,6
2	Measurement of sinusoidal voltage, frequency, effective and average values using CRO	CO-1,6
3	Verification of mesh analysis for an electrical circuit.	CO-1,6
4	Verification of nodal analysis for an electrical circuit.	CO-1,6
5	Verification of superposition theorem.	CO-1,6
6	Verification of Thevenin's & Norton's theorems.	CO-1,6
7	Verification of maximum power transfer theorem.	CO-1,6

8	Study of DC transients (time response) in RL, RC and RLC circuits.	CO-2,6
9	Study frequency response (steady state) of RL & RC networks.	CO-2,6
10	Determine the steady state response of a 2nd order circuit.	CO-3,6
11	Determine the Q factor and Bandwidth of a resonance circuit.	CO-4,6
12	Determination of open circuit (Z) and short circuit (Y) parameters	CO-5,6
13	Determination of hybrid (h) and transmission (ABCD) parameters	CO-5,6

Learning Resources
5. M.E Van Valkenburg, Network Analysis, Prentice Hall of India, Revised 3rd Ed., 2019. 6. William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, Engineering Circuit Analysis, Mc Graw Hill 9th Ed., 2020
Hardware Requirements
Regulated Power supplies, Analog/ Digital Function Generators, Digital Multimeters, Decade Resistance Boxes/ Rheostats, Decade Capacitance Boxes, Ammeters (Analog orDigital), Voltmeters (Analog or Digital), Active & Passive Electronic Components.
Software Requirements
Multisim/ Pspice /Equivalent simulation software tool, Computer Systems with required specifications
e- Resources & other Digital Material
1. http://www.cdeep.iitb.ac.in/nptel/Electrical%20&%20Comm%20Engg/Signals%20 and %20System/TOC-M1.htm 2. http://www.cdeep.iitb.ac.in/nptel/Electrical%20&%20Comm%20Engg/Signals%20and%20System/Course%20Objective.htm. 3. http://www.stanford.edu/~boyd.ee102 4. http://www.ece.gatech.edu/users/bonnie/book 5. http://ocw.mit.edu 6. https://www.youtube.com/playlist?list=PLC7D3EAEFA0CC0420&app=desktop 7. https://www.tutorialspoint.com/network_theory/network_theory_quick_guide.htm 8. https://nptel.ac.in/courses/108/105/108105159/