

# INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT./CENTRE: **Electronics and Computer Engineering**

1. Subject Code: **EC - 201** Course Title: **Linear Circuits**

2. Contact Hours: **L: 2 T: 1 P: 0**

3. Examination Duration (Hrs.): **Theory**

0	2
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**Practical**

0	0
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4. Relative Weight: **CWS**

25
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**PRS**

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**MTE**

25
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**ETE**

50
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**PRE**

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5. Credits: 

0	3
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 6. Semester 

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**Autumn Spring Both**

7. Pre-requisite: **MA-102**

8. Subject Area: **DCC**

9. Objective: To acquaint the students with the fundamental concepts of network analysis and synthesis of two-port passive networks.

10. Details of the Course:

Sl. No.	Contents	Contact Hours
1.	Review of Kirchoff's laws, nodal and loop analysis, and network theorems; Tellegen's theorem.	4
2.	Nodal and loop analysis using Laplace transform; Circuit applications: Switching in RLC circuits, switched capacitor circuits and conservation of charge; Frequency response, impulse and step response, initial and final value theorems.	5
3.	Time domain circuit response computations, convolution and Laplace transformation, time domain evaluation of the convolution integral for linear time invariant circuits, circuit response computations using convolution.	5
4.	Resonant and band pass circuits, magnetically coupled circuits, analysis of coupled circuits; Two-port networks: Admittance, impedance, hybrid, generalized and transmission parameters.	6
5.	Analysis of interconnected two-port, three-terminal networks, two-port network analysis.	3
6.	Driving point and transfer impedance/admittance functions, synthesis of two-port passive networks using ladder development.	5
<b>Total</b>		<b>28</b>

11. Suggested Books:

<b>Sl. No.</b>	<b>Name of Books/Authors</b>	<b>Year of Publication</b>
1.	Van Valkenbarg, M.E., "Network Analysis", 3 <sup>rd</sup> Ed., Prentice-Hall.	2007
2.	Van Valkenbarg, M.E., "Network Synthesis", 3 <sup>rd</sup> Ed., Prentice-Hall.	2007
3.	Kuo, F.F., "Network Analysis and Synthesis", 2 <sup>nd</sup> Ed., Wiley India.	2008
4.	Murthy, K.V.V. and Kamath, M.S., "Basic Circuit Analysis", Tata McGraw-Hill.	1989
5.	DeCarlo, R.A. and Lin, P.M., "Linear Circuit Analysis: Time Domain, Phasor and Laplace Transform Approaches", Oxford University Press.	2003
6.	Ramakalyan, A., "Linear Circuit Analysis and Synthesis", Oxford University Press.	2005