

Course Code	Course Title	L	T	P	C
1151BM104	Electric Circuit Theory	3	2	0	4

**a) Course Category**

Program core

**b) Preamble**

Any analog circuit design/debugging needs thorough analysis of current and voltage at each point. This course introduces knowledge background needed for designing any electronic circuit or solving any problems encountered in the electronic circuit

**c) Prerequisite**

None

**d) Links to other courses**

Analog Electronics and Integrated Circuits

**e) Course Outcomes**

Upon successful completion of the course the students will be able to

S.No	Course outcome	Skill Level (Blooms'sTaxonomy)
CO1	Solve circuits for current and voltage using simple mesh and node analysis and theorems	K3
CO2	Reduce the complicated circuit to an equivalent simple circuits	K3
CO3	Compute the resonance frequency of series and parallel resonance circuits	K3
CO4	Solve problems on how RL, RC and RLC circuits behave with respect to time domain for both dc/ac input	K3
CO5	Design simple RC filter circuits for the given specification	K3

## f) Course Content

**UNIT-I Basic Circuit Analysis** **15**  
Ohm's Law – Kirchoff's laws – DC and AC Circuits – Resistors in series and parallel circuits – Mesh current and node voltage method of analysis for D.C and A.C. circuits

**UNIT-II Network Theorems for DC** **15**

Network reduction: voltage and current division, source transformation – star delta conversion. Thevenin's and Norton & Theorem – Superposition Theorem – Maximum power transfer theorem– Reciprocity Theorem, (Qualitative) Treatment only

**UNIT-III Resonance and Coupled Circuits** **15**

Series and parallel resonance – frequency response, Quality factor and Bandwidth. Self and mutual inductance – Coefficient of coupling, Tuned circuits, Single tuned circuits.

**UNIT-IV Transient Response** **15**

Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C. with sinusoidal input

**UNIT-V RC Filters** **15**

Two port networks, Hybrid parameters. Passive filters-RC Low pass, High pass, Band Pass and Band Reject filters

**TOTAL : 75**  
**periods**

### TEXT BOOKS

1. Arumugam and Prem Kumar “ Electric Circuit Theory”, Khanna Publishers, 2000
2. Joseph Edminister, “Electric Cicuits” Schaum's outline series, Tata McGraw Hill Book Company, Third Edition, 2013

### REFERENCE BOOKS

1. A.Chakrabarti,” Circuit Theory – Analysis and Synthesis”, Dhanpat Rai & Co. New Delhi, Fifth Edition 2006
2. Hayt W.H and Kemmerley J.E,” Engineering Circuit Analysys”, Tata McGraw Hill Book Co., Fifth Edition 2002