| I Year II Semester | L T | P C |
|--------------------|----------|-----|
| Code: 20ES2002 | 3 0 | 0 3 |
| BASIC ELECTRIC | CIRCUITS | |

Preamble: This course is designed to give comprehensive treatment of both dc and ac networks. More emphasis is given to fundamentals i.e., to different laws, theorems of basic Electrical Engineering. The knowledge of this course is very much useful to understand the core concepts of Electrical and Electronics Engineering.

Course Objectives:

- 1. Summarize the properties of electrical elements and networks
- 2. Compute network variables with the help of various analytical methods
- 3. Select appropriate network theorems to analyze electric circuits.
- 4. Evaluate the frequency response of electric networks

Course Outcomes:

- 1. Summarize the properties of electrical elements and networks
- 2. Compute network variables with the help of various analytical methods
- 3. Select appropriate network theorems to analyze electric circuits.
- 4. Evaluate the frequency response of electric networks

UNIT-I: Introduction to Electrical Circuits

Basic electrical components and sources, Network reduction techniques, Source transformation, Nodal analysis and Mesh analysis.

UNIT-II: Sinusoidal analysis on A.C Systems

AC fundamentals, concept of phasors and powers, AC circuits Steady State Analysis of R, L, C series ¶llel circuits, Resonance.

UNIT-III: Network theorems (DC &AC Excitations)

Super position theorem, Thevenin's theorem, Norton's theorem, Maximum Power Transfer Theorem, Reciprocity theorem, Millman'stheorem, Tellegen's theorem

UNIT-IV: Magnetic circuits and Resonance

Fundamentals of magnetic circuits, Self and mutual inductance, Dot convention-coefficient of coupling, Analysis of series and parallel magnetic circuits, Concept of bandwidth and Quality factor, Passive filters.

UNIT-V: Three Phase circuits Introduction, Analysis of balanced and unbalanced circuits

RAGHU ENGINEERING COLLEGE (Autonomous)

Text Books:

- 1. Engineering Circuit Analysis by William Hayt and Jack E.Kemmerley, Mc Graw Hill Company, 6thedition
- 2. Fundamentals of Electrical Circuits by Charles K. Alexander and Mathew N.O. Sadiku, McGraw Hill Education (India)

Reference Books:

- 1. Network Analysis: Van Valkenburg; Prentice-Hall of India Private Ltd.
- 2. Electrical Circuit Analysis by ASudhakar and SP Shyam Mohan, TMH.
- 3. Circuit Theory (Analysis and Synthesis) by A.Chakrabarthi, Dhanpat Rai & Co.
- 4. Electric Circuits by David A.Bell, Oxford publications
- 5. Electric Circuits– (Schaum's outlines) by Mahmood Nahvi & Joseph Edminister, Adapted by K. Uma Rao,5th Edition– Mc Graw Hill