1/4 B.Tech - FIRST SEMESTER

EC1T4 **Basic Electrical &Electronics Engineering** **Credits: 4**

Lecture : 4 periods/week **Internal assessment: 30 marks**
Tutorial: 1 period /week **Semester end examination: 70 marks**

Course Objectives:

- To impart the basic knowledge about the Electric and Magnetic circuits
- To inculcate the understanding about the Network Analysis
- To understand the working of various secondary cells
- To understand about electronic dynamcs

UNIT – I

Introduction to Electrical Engineering : Essence of electricity, Conductors, semiconductors and insulators (elementary treatment only); Electric field; electric current, potential and potential difference, electromotive force, electric power, ohm's law, basic circuit components

UNIT-II

Network Analysis : Network elements classification, Resistance parameter – series and parallel combination, Inductance parameter – series and parallel combination, Capacitance parameter – series and parallel combination. Energy sources: Ideal, Non-ideal, Independent and dependent sources, Kirchoff's laws and simple problems.

UNIT-III

Network theorems(Independent sources): Superposition , Thevenins's, Maximum power transfer theorems and simple problems using independent sources only

UNIT-IV

Magnetic Circuits:

Magnetic circuits-Basic definition of MMF, flux and reluctance-Analogy between electrical and magnetic circuits, Faraday's laws of electromagnetic induction-concept of self and mutual inductance-dot convention-coefficient of coupling-composite magnetic circuit-analysis of series and parallel magnetic circuits

UNIT V

Secondary cells: Led Acid cells, Nickel iron cell, Nickel cadmium cells, construction, principle of operation**,** charging and discharging, losses and efficiency and maintenance**.**

UNIT VI:

Electron Dynamics: Introduction, Electron Ballastics, force, field intensity, two dimensional motion of electron , motion in electric field, motion in a magnetic field, parallel electric and magnetic fields, perpendicular electric and magnetic fields

UNIT VII:

Electron deflection systems: Electro static deflection in cathode ray tube, magnetic deflection in cathode ray tube, comparison between electric and magnetic deflection systems

UNIT VIII:

Physical propertiesof Elements: Atomic theory, Energy band structures of conductors, semi-conductors, insulators, conduction in insulators, semi conductors and conductor, practical semiconductor materials

Learning Resources

Text Books:

1. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshiah – TMH.
2. Thomas L. Floyd, "Electronic Devices", Pearson, 7th edition.

References:

1.. Basic Electrical Engineering –By T.K.Nagasarkar and M.S. Sukhija Oxford University Press.
2. Principles of Electrical Engineering by V.K Mehta, S.Chand Publications.
3. Electronic Devices and Circuits – S.Salivahanan, N.S.Kumar and A.Vallavaraj, Tata Mc-Graw Hill.
4. Electronic Devices and Circuits – R.L.Boylested and Louis Nashelsky, Pearson/ Prentice Hall, 9th edition, 2006.