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 dynamics
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Learning Outcomes:

- Students will have the knowledge of basic electrical components and electronic devices .
- Students will learn how to simplify an electrical circuit using different theorems and laws.
- Students will gain the knowledge about the materials (conductors, semi conductors ,insulators and magnetic materials) .
- Student will be knowing how charging and discharging takes place in secondary cells.

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

Learning Resources

Text Books:

1. Basic Electrical Engineering , M.S.Naidu and S. Kamakshiah, TMH,2001
2. Thomas L. Floyd, Electronic Devices, Pearson Prentice Hall, 7th edition,2005.

References:

1. Basic Electrical Engineering, T.K.Nagasarkar and M.S. Sukhija, Oxford University Press,2005
2. Principles of Electrical Engineering, V.K Mehta, S.Chand Publications, 11th Edition,2010.
3. Electronic Devices and Circuits, S.Salivahanan, N.S.Kumar and A.Vallavaraj, TMH, 2nd Edition, 2008.
4. Electronic Devices and Circuits, R.L.Boylested and Louis Nashelsky, Pearson/ Prentice Hall, 9th Edition, 2006.