

1/4 B.Tech. SECOND SEMESTER

CE2T4 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING Credits: 3

Lecture: 3 periods/week

Internal assessment: 30 marks

Tutorial: 1 period /week

Semester end examination: 70 marks

Objectives:

- To impart the basic knowledge about the Electric and Magnetic circuits
- To inculcate the understanding about the AC fundamentals
- To understand the working of various Electrical Machines
- To know about various measuring instruments and house wiring

Learning outcomes:

At the end of the course the students will have:

- Basic knowledge about the Electric and Magnetic circuits
- Understanding about the AC fundamentals and the working of various Electrical Machines

UNIT-I

ELECTRICAL CIRCUITS:

Basic definitions, Types of elements, Ohm's Law, Resistive networks, Kirchhoff's Laws, Inductive networks, Capacitive networks, Series, Parallel circuits and Star-delta and deltastar transformations.

UNIT II

DC MACHINES:

Principle of operation of DC Generator – emf equation - types – DC motor types – torque equation – applications – three point starter.

UNIT III

TRANSFORMERS:

Principle of operation of single phase transformers – emf equation – losses – efficiency and regulation

UNIT IV

AC MACHINES:

Principle of operation of alternators – regulation by synchronous impedance method – Principle of operation of induction motor – slip – torque characteristics – applications.

UNIT V

INSTRUMENTS:

Basic Principle of indicating instruments – permanent magnet moving coil and moving iron instruments.

UNIT VI

DIODE AND IT'S CHARACTERISTICS:

P-N junction diode, symbol, V-I Characteristics, Diode Applications, Rectifiers – Half wave, Full wave and Bridge rectifiers (simple Problems)

UNIT VII

TRANSISTORS:

P-N-P and N-P-N Junction transistor, Transistor as an amplifier, SCR characteristics and applications

UNIT VIII

CATHODE RAY OSCILLOSCOPE:

Principles of CRT (Cathode Ray Tube), Deflection, Sensitivity, Electrostatic and Magnetic deflection, Applications of CRO - Voltage, Current and frequency measurements.

Learning resources

Text books:

1. Essentials of Electrical and Computer Engineering, (3rd edition) by Kerns, V. and David, J.R., Pearson Education, 2005.
2. Principles of Electrical and Electronics Engineering, (1st edition) by Mehta, V.K., S. Chand & Co, 2012.

Reference books:

1. Introduction to Electrical Engineering by Naidu, M.S. and Kamakshaiah, S., Tata McGraw-Hill, 1995.
2. Basic Electrical Engineering, (3rd Edition) by Kothari and Nagarath., Tata McGraw-Hill, 2009.