

BASIC ELECTRICAL ENGINEERING

(Common to CSE, IT during I B.Tech., I Semester)

Course Code(s): CS1T5, IT1T5

Credits: 3

Lecture: 3 periods/week

Internal assessment: 30 marks

Tutorial: 1 period /week

Semester end examination: 70 marks

Prerequisite: There are no prerequisites for this course.

Course Objectives:

- To impart the basic knowledge about the Electric circuit and magnetic circuits.
- To understand the working of various DC and AC motors.
- To know the operation of transformer.
- To know the various electrical measuring instruments.

Course outcomes: At the end of the course the students will have:

- Basic knowledge about the Electric and Magnetic circuits.
- Understands the working of various DC and AC Motors.
- Understands the operation of transformer.
- Analyze the working of electrical measuring instruments.

UNIT - I

Introduction to Electrical Engineering: Basic Definitions, ohm's law, Voltage and current source. Kirchhoff's laws, basic circuit components, series parallel resistance circuits, mesh analysis and nodal analysis (only on independent sources). Star-Delta/Delta-Star conversion, simple problems.

UNIT-II

Magnetic Circuits: Basic definitions ,Magnetic field due to electric current flow, force on a current carrying conductor placed in a magnetic field, Faradays laws of electromagnetic induction, analogy between electric and magnetic circuits, self inductance and mutual inductance, coefficient of coupling, coils connected in series and parallel, Types of induced EMF's, Simple problems.

UNIT-III

Alternating Quantities : Principle of ac voltages , waveforms and basic definitions, relationship between frequency, speed and number of poles, root mean square and average values of alternating currents and voltage, form factor and peak factor, phasor representation of alternating quantities, analysis of ac circuits with simple basic network elements, single phase series circuits, single phase parallel circuits, power in ac circuits.

UNIT-IV

DC Machines: Principle of operation of dc motor, Torque production in a dc motor, Types of DC motors, three point starters.

A.C Machines: Construction and Principle of operation of three phase induction motor, slip, rotor frequency and torque (simple problems).

UNIT-V

Transformers: Principles of operation, Constructional Details, Ideal Transformer and Practical Transformer, Losses, Efficiency(All the above topics are only elementary treatment and simple problems).

Basic Instruments : Introduction, classification of instruments, operating principles, essential features of measuring instruments, Moving coil permanent magnet (PMMC) instruments, Moving Iron Ammeters and Voltmeters (elementary Treatment only).

TEXT BOOKS:

1. Principles of Electrical Engineering by V.K Mehta, S.Chand Publications.
2. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshiah – TMH.

REFERENCES:

1. Theory and Problems of Basic Electrical Engineering by D.P.Kothari & I.J. Nagrath PHI.
3. Basic Electrical Engineering –By T.K.Nagasarkar and M.S. Sukhija Oxford University Press.

**P.V.P.Siddhartha Institute of Technology(Autonomous), I B.Tech. syllabus under PVP14 regulations
e-learning resources:**

<http://nptel.ac.in/courses.php>

<http://jntuk-coeerd.in/>