BASIC ELECTRICAL ENGINEERING

MODULE-I (6 HOURS)

D.C Networks: Kirchoff's laws, node voltage and mesh current methods, delta-star and star-delta conversions, superposition principle, Thevenin's and Norton's theorems, Maximum Power Transfer Theorem.

MODULE-II (6 HOURS)

Single phase and three phase ac circuit: Average and effective values of sinusoids, solution of R, L, C series circuits, solution of series and parallel circuits, series -parallel resonance.

Line and phase quantities, Delta and star connections, solution of the balanced three phase circuits, measurement of power in three phase circuits.

MODULE-III (6 HOURS)

Magnet circuit & principle of electromechanical energy conversion: Review of fundamental laws of electromagnetic induction, Solution of simple magnetic circuits.

DC machine: Construction, types, emf equation of generator, torque equation of motor, speed control of DC motors

MODULE-IV (6 HOURS)

AC MACHINES: Single Phase Transformer: Construction, emf equation, no load and load operation, voltage regulation and efficiency.

Three Phase Induction Motor: Construction, principle of working, concept of slip, torque speed relation.

Principle of operation of Three Phase alternator.

MODULE-V (6 HOURS)

Introduction to Power System: General structure of electrical power systems, Concepts of Generation, Transmission and Distribution, Sources of Electrical Power

ESSENTIAL READING

[1]. G. Rizzoni, Principles and Applications of Electrical Engineering, TMH , 2017

[2]. Nagrath I.J. and D. P. Kothari, Basic Electrical Engineering, Tata McGraw Hill.

SUPPLEMENTARY READING

[1]. S. Parker Smith, "Problems in Electrical Engineering", Asia Publications, 10th Edition.

[2]. Edward Hughes (revised by Ian McKenzie Smith), "Electrical & Electronics Technology", Pearson Education Limited. Indian Reprint 2002, 10th Edition.

Course Outcomes:

Upon completion of the subject the students will demonstrate the ability to:

CO1	Implement principles of DC network, theorems and transients.
CO2	Analyze the concept of Single phase and three phase AC circuits.
CO3	Express the concept of magnetic circuit and DC machines.
CO4	Apply basic principles of AC machines and their working.
CO5	Demonstrate basic principles of power system