BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

III Semester

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5EE70	**ESC**	3	1	-	4	30	70	100

COURSE OBJECTIVES:

1. Describe basic fundamentals of Electric Circuits, their components and the mathematical tools used to represent and analyze Electrical circuits.
2. Develop fundamentals, including Ohm's law, Kirchoff's laws and be able to solve for currents, voltages and power in complex circuits.
3. Demonstrate to write and solve loop current and node voltage equations for arbitrary DC, AC networks including resistors, capacitors, inductors, dependent and independent sources.
4. Extrapolate the concept of magnetic circuit, Faraday's laws and analyze the series and parallel magnetic circuits.
5. Summarize various two port network parameters and their relations and develop the design and analysis of basic DC and AC circuits with network topologies.

UNIT-I	ELECTRICAL CIRCUITS

Basic definitions-Ohm's Law – Kirchhoff's Laws – simple problems. types of elements, types of sources, resistive networks, inductive networks, capacitive networks, series & parallel circuits, star to delta and delta to star transformations.

UNIT-II	DC MACHINES

Principle of Operation of DC Motor, types of DC motor, Losses and Torque equation, DC Generator construction and working Principle, EMF Equation, working principle and Construction of transformer.

UNIT-III	AC MACHINES & INSTRUMENTS

Principle of operation of 3-phase induction motor, slip and torque Equation, principle of operation of 3-phase Alternator. Basic principle of indicating instruments, permanent magnet moving coil and moving iron instruments.

UNIT-IV	SEMICONDUCTOR DEVICES

Characteristics of PN Junction Diode – Zener Effect – Zener Diode and its Characteristics. Rectifiers, Half wave, Full wave and bridge Rectifiers – filters capacitor, inductor-Voltage Regulation.

UNIT-V	TRANSISTOR

Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics – Transistor Amplifier.

Text Books:

1. Basic Electrical Engineering by *M.S.Naidu and S.Kamakshaiah* TMH
2. Electronic Devices and circuits by *J.Millman, C.C.Halkias and Satyabrata Jit* 2ed.,

Reference Books:

1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, "Basic Electrical, Electronics and Computer Engineering",Tata McGraw Hill, Second Edition, (2006).
2. Nagsarkar T K and Sukhija M S, "Basics of Electrical Engineering", Oxford press (2005).

COURSE OUTCOMES:
Student should able to

1	Understand basic electrical concepts, including electric charge, current, electrical potential, electrical Power and energy.
2	Distinguish the relationship of voltage and current in resistors, capacitors, inductors, and mutual Inductors.
3	Differentiate circuits with ideal, independent, and controlled voltage and current sources and able to apply Kirchhoff's voltage and current laws to the analysis of electric circuits.
4	Apply concepts of electric network topology, nodes, branches, and loops to solve circuit problems, including the use of computer simulation.
5	Emphasize on basic laws and techniques to develop a working knowledge of the methods of analysis used in electric circuits.
6	Interpret to solve series and parallel magnetic circuits
7	Design various two port network parameters and relations between mutual and self inductances.