22EE101	Basic Electrical and Electronics Engineering	L	T	P	C
	(Common to Civil, Mechanical and Computer science Engineering)	3	1	0	4

Course Objectives:

1.	To understand and analyze basic electric circuits.
2.	To study working principle of electrical machines and transformer.
3.	To study basics of electronic devices and operational amplifier.
4.	To understand the concepts of electrical installations.

Unit I	DC CIRCUITS	9	+	3

Electrical circuit elements (R, L and C) - Voltage and current sources - Ohm's law and Kirchoff's laws- Series and parallel circuits - Analysis of simple electrical circuits with DC excitation using fundamental laws – Superposition theorem, Thevenin's and Norton's theorems.

Unit II	AC CIRCUITS	9	+	3

Introduction to single phase AC circuits - Representation of sinusoidal waveforms, peak and RMS values, phasor representation- Analysis of single-phase ac circuits consisting of RL, RC, RLC combinations (series and parallel), real power, reactive power, apparent power, power factor. Three phase AC circuits, voltage and current relations in star and delta connections.

Unit III	ELECTRICAL MACHINES AND TRANSFORMERS	9	+	3

DC Motor: Construction, operation, types and applications, Speed control of DC shunt motor - Construction and working of three-phase induction motors - Working of single-phase induction motor and its applications – Transformers: Ideal and practical transformer, Construction and working, losses and efficiency in transformers, Introduction to Three phase transformers.

Unit IV	BASICS ELECTRONICS SYSTEM	9	+	3

Introduction - Basic structure of semiconductors devices- PN junction diode, Zener diode and V-I characteristics- BJT – CE, CB, CC configuration and working principle. Operational Amplifier- principle of operation, Characteristics, Applications-Inverting Amplifier, Non inverting Amplifier, summing amplifier and differential amplifier.

Unit V	ELECTRICAL INSTALLATIONS	9	+	3

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB - Types of wires and cables – Earthing - Basics of house wiring tools and components, types of house wiring – Batteries: Principle characteristics-Types and its applications - Introduction to UPS and SMPS.

Total (L+T)= 60 Periods

Course Outcomes:

Upon completion of this course, the students will be able to:

CO1	:	Analyse the DC circuits using fundamental laws and theorems.
CO2	:	Analyse the single and three phase AC circuits.
CO3	:	Understand the working principle of electrical machines and transformers.
CO4	:	Familairse the fundamentals and characteristics of diode, BJT and operational amplifier.
CO5	:	Understand the concept of electrical installations.

Text Books:

1.	R.Muthu subramaniyam, R. Salivaganan and K. A Muralidharan , "Basic Electrical and Electronics Second Edition Engineering", Tata McGraw Hill, 2010.
2.	D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
3.	D.C.Kulshreshtha, "Basic Electrical Engineering", Tata McGraw Hill, 2009.

Reference Books:

1.	L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
2.	E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.