

ELECTRICAL ENGINEERING DEPARTMENT

Course:- Bachelor of Technology (Electrical Engineering)

Semester	First/Second	Subject Title	Basic Electrical Engineering		Code	TEE 101/201
Course Components	Credits		Contact Hours	L	T	P
Foundation Course (FC)	03		03	--	--	--
Examination Duration (Hrs)	Theory	Practical	WEIGHTAGE:EVALUATION	CWA	MSE	ESE
	03	01		25	25	50

Pre-requisite: Basic Knowledge of Mathematics and Physics

Course Objectives

- CO 1 To understand and analyze basic electric circuits
- CO2 Assess the various characteristics of Alternating Current/Voltage.
- CO3 Understand the concept of three-phase AC circuits.
- CO4 Summarize the basic characteristics of single-phase transformer.
- CO5 To introduce the components of low voltage electrical installations
- CO6 To study the working principles of electrical machines

Unit No.	Content	Hours
Unit -1	DC Circuits: Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws, Mesh and Node analysis with DC source. Superposition, Thevenin and Norton Theorems.	8
Unit -2	AC Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance. Three-phase balanced circuits, voltage and current relations in star and delta connections	8
Unit -3	Transformers : Magnetic circuit, BH characteristics, ideal and practical transformer, equivalent circuit, losses and efficiency of transformers, auto-transformer.	8
Unit -4	Electrical Installations : Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, RCD, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement.	9
Unit -5	Electrical Machines: Working principle and e.m.f equation of dc machine, magnetization internal and external characteristic of separately excited dc generator, torque speed characteristic of separately excited dc motor, working principle of three phase induction motor and slip speed and torque slip characteristic of induction motor. Working principle of alternator.	9
Total Hours		42

Test/ Reference Books:

1. D.P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2. D.C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
3. V. N Mittle and Arvind Mittle, "Basic Electrical Engineering" Tata McGraw-Hill Education Pvt. Ltd. (2005)
4. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
5. L.S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
6. V.D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.