21GEN03	BASIC ELECTRICAL & ELECTRONICS ENGINEERING	L	T	P	C
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Course Objectives

1. To understand the various laws and theorems applied to solve electric circuits and networks
2. To import knowledge of different components and function of electrical machines
3. To explain the fundamentals and applications of semiconductor devices
4. To explain the principles of digital electronics
5. To provide the students with an overview of the most important concepts in Electrical and Electronics Engineering which is the basic need for every engineer

UNIT-I	DC CIRCUITS	9 Hours

Basic circuit elements and sources, Ohms law, Kirchhoff's laws, series and parallel connection of circuit elements, Node voltage analysis, Mesh current analysis, Thevenin's and Maximum power transfer theorem.

UNIT-II	AC CIRCUITS	9 Hours

Alternating voltages and currents, AC values, Single Phase RL, RC, RLC Series circuits, Power in AC circuits-Power Factor- Three Phase Systems–Star and Delta Connection.

UNIT-III	ELECTRICAL MACHINES	9 Hours

Construction, Working Principle and applications of DC Machines, Transformers, Single phase and Three-phase Induction motors and Stepper motor

UNIT-IV	SEMICONDUCTOR DEVICES AND SENSORS	9 Hours

Conduction in Semiconductor materials, Construction and Working of PN junction diodes, Zener diodes, BJTs, MOSFETs, Rectifiers - Half wave, Full wave, Sensors - LVDT, Thermocouple.

UNIT-V	DIGITAL SYSTEMS	9 Hours

Binary Number System - Boolean Algebra – DeMorgan's theorem – Digital circuits – Half adder, Full adder - Introduction to Sequential Circuits – Flip-Flops - Registers - SISO, SIPO, PISO, PIPO and Counters – Johnson and Ring.

Total: 45

Course Outcome

1. Solve basic electrical circuit problems using various laws and theorems
2. Analyze AC power circuits and networks, its measurement and safety concerns
3. Classify and compare various types of electrical machines
4. Design and implement various digital circuits
5. Analyze the characteristics of semiconductor devices

Text Books:

1. D.P. Kothari & I.J. Nagarath, "Basic Electrical and Electronics Engineering", McGraw Hill Education (India) Private Limited, Third Reprint, 2016.
2. S.K. Bhattacharya "Basic Electrical and Electronics Engineering", Pearson India, 2011.

Reference Books:

1. A.E.Fitzgerald, David E Higginbotham and Arvin Grabel, "Basic Electrical Engineering", McGraw Hill Education (India) PrivateLimited,2009.
2. DelToro,"ElectricalEngineeringFundamentals",PearsonEducation,NewDelhi, 2007
3. Leonard S Bobrow, " Foundations of Electrical Engineering", Oxford University Press,2013
4. Mahmood Nahvi and Joseph A. Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill, 2002
5. Mehta VK, "Principles of Electronics", S.Chand & CompanyLtd,1994
6. Nagsarkar T K and Sukhija MS, "Basics of Electrical Engineering", Oxford press2005