

Semester: I / II						
BASICS OF ELECTRICAL ENGINEERING (Category: Engineering Science) (Theory)						
Course Code	:	22ES14D		CIE	:	100 Marks
Credits: L:T:P	:	3:0:0		SEE	:	100 Marks
Total Hours	:	40L		SEE Duration	:	3.00 Hours

Unit-I		08 Hrs
DC circuits: Ohm's law and Kirchhoff's laws, analysis of series, parallel and series-parallel circuits excited by independent voltage sources. Derivation for Power and energy, Thevenin Theorem & Maximum Power Transfer Theorem applied to the series circuit and its applications.		
Unit – II		08 Hrs
AC Fundamentals: Generation of sinusoidal voltage, frequency of generated voltage, average value, RMS value, form, and peak factors. Voltage and current relationship, with phasor diagrams, in R, L, and C circuits. Single-phase Circuits: Analysis of single-phase ac series circuits R, L, C, RL, RC, RLC, resonance in series RLC circuit		
Unit –III		08 Hrs
Three phase circuits.: Generation of three-phase power, representation of balanced star and delta connected loads the relation between phase and line values of voltage and current from phasor diagrams, advantages of three-phase systems. Measurement of three-phase power by two-wattmeter method. Transformers: Single phase transformers: Construction, principle of working, EMF equations, voltage and current ratios, losses, definition of regulation and efficiency.		
Unit –IV		08 Hrs
Three Phase Induction motors: Three-phase induction motors. Principle of operation, construction, types. Rotating magnetic field, significance of torque-slip characteristic. Single Phase Induction Motor: Single-phase induction motor. Construction, Principle of operation, Types of single-phase induction motors.		
Unit –V		08 Hrs
Power transmission and distribution: Concept of power transmission and power distribution. through block diagrams only. Electricity bill: Calculation of electricity bill for domestic consumers. Equipment Safety measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits. Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.		
Course Outcomes: After completing the course, the students will be able to		
CO1:	Understand the working of electric circuits, transformer, electrical machines, and safety devices.	
CO2:	Evaluate the AC & DC circuit parameters and characteristics of A.C machines and transformers	
CO3:	Analyze the performance of Electrical machines and methods of power transmission & distribution.	
CO4:	Apply the knowledge of electrical equipment, tariff, safety measures for engineering applications.	

Reference Books	
1	D. C. Kulshreshtha, Basic Electrical Engineering, McGraw-Hill Education , 1 st Edition, 2019.
2	D.P. Kothari and Nagrath Theory and Problems in electrical Engineering, PHI Edition 2011.
3	V. K. Mehta, “Basic Electrical Engineering”, S.Chandand Company Ltd., New Delhi.
4	V. N. Mittal, “Basic Electrical Engineering”, TMH Publication, New Delhi.

ASSESSMENT AND EVALUATION PATTERN		
WEIGHTAGE	50%	50%
QUIZZES		
Quiz-I	Each quiz is evaluated for 10 marks adding up to 20 MARKS.	*****
Quiz-I		
THEORY COURSE (Bloom’s Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating)		
Test – I	Each test will be conducted for 50 Marks adding upto 100 marks. Final test marks will be reduced to 40 MARKS	*****
Test – II		
EXPERIENTIAL LEARNING	40	*****
Case Study-based Teaching-Learning	10	*****
Sector wise study & consolidation (viz., Engg. Semiconductor Design, Healthcare & Pharmaceutical, FMCG, Automobile, Aerospace and IT/ITeS)	20	
Video based seminar (4-5 minutes per student)	10	
MAXIMUM MARKS FOR THE THORRY	100 MARKS	100 MARKS
TOTAL MARKS FOR THE COURSE	100	100