Semester: I / II						
BASICS OF ELECTRICAL ENGINEERING **Category: Engineering Science Course** **(Common to all Programs Except EE Program)** **(Theory)**						
Course Code	**:**	**EE113AT / EE123AT**		**CIE**	**:**	100 Marks
Credits: L:T:P	**:**	**3:0:0**		**SEE**	**:**	100 Marks
Total Hours	**:**	**40L**		**SEE Duration**	**:**	3 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: C**alculation 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 , 1st Edition, 2019, ISBN- 13:978-0071328968.
2	D.P. Kothari and Nagrath Theory and Problems in electrical Engineering, PHI Edition 2016, ISBN-978-81-203-5279-7.
3	V. K. Mehta, Basic Electrical Engineering, S.Chandand Company Ltd., New Delhi, 2006, ISBN-13: 978-8121908719.
4	V. N. Mittal, Basic Electrical Engineering, TMH Publication, New Delhi, 2006, ISBN: 9780070593572.

RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)		
#	**COMPONENTS**	**MARKS**
1	**QUIZZES:** Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. **THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.**	**20**
2	**TESTS:** Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). TWO tests will be conducted. Each test will be evaluated for 50 Marks. **FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.**	**40**
3	**EXPERIENTIAL LEARNING:** Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (05), Program specific requirements (05), Video based seminar/presentation/demonstration (10), **MATLAB (20) ADDING UPTO 40 MARKS**.	**40**
	MAXIMUM MARKS FOR THE CIE THEORY	**100**

RUBRIC FOR SEMESTER END EXAMINATION (THEORY)		
Q. NO.	**CONTENTS**	**MARKS**
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B (Maximum of TWO Sub-divisions only)	
2	Unit 1 : (Compulsory)	16
3 & 4	Unit 2 : Question 3 or 4	16
5 & 6	Unit 3 : Question 5 or 6	16
7 & 8	Unit 4 : Question 7 or 8	16
9 & 10	Unit 5: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	**100**