

Course Code	Course Title	L	T	P	C
BEEE102L	Basic Electrical and Electronics Engineering	3	0	0	3
Pre-requisite	NIL	Syllabus version			
		1.0			
Course Objectives					
1. Familiarize with various laws and theorems to solve electric and electronic circuits					
2. Provide an overview on working principle of machines					
3. Excel the concepts of semiconductor devices, op-amps and digital circuits					
Course Outcomes					
On completion of the course, the students will be able to:					
1. Evaluate DC and AC circuit parameters using various laws and theorems					
2. Comprehend the parameters of magnetic circuits					
3. Classify and compare various types of electrical machines and its applications					
4. Design basic combinational circuits in digital system					
5. Analyze the characteristics and applications of semiconductor devices					
Module:1	DC Circuits	7 hours			
Basic circuit elements and sources; Ohms law; Kirchhoff's laws; Series and Parallel connection of circuit elements; Star-delta transformation; Mesh current analysis; Node voltage analysis; Theorems: Thevenin's, Maximum power transfer and Superposition theorem.					
Module:2	AC Circuits	8 hours			
Alternating voltages and currents, RMS, average, maximum values, Single Phase RL, RC, RLC series circuits, Power in AC circuits, Power Factor, Three phase balanced systems, Star and delta Connections, Electrical Safety, Fuses and Earthing.					
Module:3	Magnetic Circuits	7 hours			
Magnetic field; Toroidal core: Flux density, Flux linkage; Magnetic circuit with airgap; Reluctance in series and parallel circuits; Self and mutual inductance; Transformer: turn ratio determination.					
Module:4	Electrical Machines	7 hours			
Construction, working principle and applications of DC Machines, Transformers, Three phase Induction motors, synchronous generators, single phase induction motors, special machines stepper motor, universal motor and BLDC motor.					
Module:5	Digital Systems	7 hours			
Binary arithmetic; Number base conversion; Boolean algebra: simplification of Boolean functions using K-maps; Logic gates; Design of basic combinational circuits: adders, multiplexers, de-multiplexers.					
Module:6	Semiconductor Devices and Applications	7 hours			
Characteristics: PN junction diode, Zener diode, BJT, MOSFET; Applications: Rectifier, Voltage regulator, Operational amplifier.					
Module:7	Contemporary Issues	2 hours			
Total Lecture hours:					45 hours
Text Books					
1	Allan R. Hambley, "Electrical Engineering -Principles & Applications", 2019, 6 th Edition, Pearson Education				
2	V. D. Toro, Electrical Engineering Fundamentals, 2 nd edition. PHI, 2014				
Reference Books					
1	R. L. Boylestad and L. Nashelsky, Electronic Devices and Circuit Theory, 11 th edition.				

	Pearson, 2012		
2	DP Kothari & Nagrath, "Basic Electric Engineering", 2019, Tata McGraw Hill		
Recommended by Board of Studies		28-05-2022	
Approved by Academic Council		No. 67	Date 08-08-2022