

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY

III Semester: AE / ME								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AEE103	Foundation	L	T	P	C	CIA	SEE	Total
		-	-	3	2	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36			Total Classes: 36			
I. COURSE OVERVIEW:								
The objective of the Basic Electrical Engineering Laboratory lab is to expose the students to the electrical circuits and give them experimental skill. It also aims to get the knowledge of the different electronic devices like diodes, rectifiers, transistors. It provides hands-on experience by examining the electrical characteristics of various AC and DC machines.								
II. OBJECTIVES:								
The course should enable the students to:								
I Implement different circuits and verify circuit concepts for DC circuits.								
II Gain knowledge on semiconductor devices like diode and transistor.								
III Interpret different transistor configurations.								
IV The operation and characteristics of AC machines and DC machines.								
III. COURSE OUTCOMES:								
After successful completion of the course, students should be able to:								
CO 1	Solve the electrical circuit source resistance, currents, voltage and power by applying various network reduction techniques.						Apply	
CO 2	Apply magnetization characteristics of dc shunt generator for calculating the critical resistance and speed control methods and performance characteristics of DC Shunt machine and Transformer for efficiency.						Apply	
CO 3	Acquire basic knowledge on the working of PN-junction diode,Zener diode to plot their V-I characteristics.						Understand	
CO 4	Identify transistor configuration and their working to deduce its working as switch and amplifier.						Apply	
CO 5	Explore the knowledge and skills of employability to succeed in national and international level competitive examinations.						Apply	
IV. SYLLABUS:								
LIST OF EXPERIMENTS								
Week - 1	KIRCHHOFF'S CURRENT LAW AND VOLTAGE LAW							
Verification of Kirchhoff's current and voltage laws.								
Week - 2	OHMS LAW							
Verification of ohms law.								
Week - 3	OPEN CIRCUIT CHARACTERISTICS OF DC SHUNT GENERATOR							
Magnetization characteristics of DC shunt generator.								

Week - 4	SWINBURNE'S TEST
Predetermination of efficiency (Swinburne's test) of DC shunt machine.	
Week - 5	OPEN CIRCUIT AND SHORT CIRCUIT TEST
Open circuit and short circuit test on single phase transformer.	
Week - 6	BRAKE TEST ON THREE PHASE INDUCTION MOTOR
Study the performance characteristics of three phase induction motor by brake test.	
Week - 7	REGULATION OF ALTERNATOR
Determine the regulation of alternator using synchronous impedance method.	
Week - 8	PN JUNCTION DIODE
PN junction diode characteristics.	
Week - 9	ZENER DIODE
Zener diode characteristics.	
Week - 10	HALF WAVE RECTIFIER CIRCUIT
Half wave rectifier circuit.	
Week - 11	FULL WAVE RECTIFIER CIRCUIT
Full wave rectifier circuit.	
Week - 12	TRANSISTOR
Transistor common emitter characteristics.	
Week - 13	TRANSISTOR
Transistor common base characteristics.	
Week - 14	CRO
Study of CRO.	
Reference Books:	
<ol style="list-style-type: none"> 1. A Chakrabarti, "Circuit Theory", Dhanpat Rai Publications, 2004. 2. N C Jagan, C Lakshminarayana, "Network Analysis", B S Publications J 3. J P J Millman, C C Halkias, Satyabrata Jit, "Millman's Electronic Devices and Circuits", Tata McGraw Hill, 2nd Edition, 1998. 4. R L Boylestad, Louis Nashelsky, "Electronic Devices and Circuits", PEI/PHI, 9th Edition, 2006. 	

Web References:

1. <https://www.nptel.ac.in/Courses/117106108>
2. <https://www.gnindia.dronacharya.info/EEEDept/labmanuals.html>
3. <https://www.textofvideo.nptel.iitm.ac.in>
4. <https://www.textofvideo.nptel.iitm.ac.in/>

Course Home Page:**LIST OF EQUIPMENT REQUIRED FOR A BATCH OF 36 STUDENTS:**

S. No	Name of the Equipments	Range	Quantity
1	RPS	0-30V DC	20
2	CRO		5
3	1- ϕ Transformer	3KVA	4
4	3- ϕ Induction Motor	--	1
5	1- ϕ Variac	(0-230/270V,15A)	4
6	3- ϕ Variac	(0-440V/470V,15A)	4
7	DC Shunt Motor-Generator Set	--	2
8	Ammeter	(0-2.5/5A)MI	7
9	Ammeter	(0-10/20 A)MI	7
10	Voltmeter	(0-150/300V)MI	10
11	Voltmeter	(0-300/600V)MI	10
12	Wattmeter	(5/10A,75/150/300V) LPF	4
13	Wattmeter	(10/20A,150/300/600V) UPF	4
14	Control Panels	--	2
15	Tachometers	(0-9999 RPM)	3
16	Resistors	150 Ω ,470 Ω ,1k Ω ,2.2k Ω ,10k Ω , 47k Ω ,100k Ω ,1M Ω	100
17	Capacitors	0.1 μ F,10 μ F,100 μ F	100
18	Diode	1N4007	100
19	Zener Diode	4.7V	100
20	Transistors	BC107	50
21	Decade Resistance Box	10 Ω -10M Ω	20

22	Voltmeter	0-20V	25
23	Ammeter	0-200 μ A, 0-10 μ A, 0-1 mA, 0-10 mA	30
24	Bread Board	--	15
25	Trainer Kits	--	18
26	Connecting Wires	--	--