BASIC ELECTRICAL AND ELCTRONICS ENGINEERING LABORATORY

I Semester: CE | II Semester: ME

Course Code	Category	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AEEB08	Foundation	-	-	3	1.5	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. The purpose of lab experiment is to continue to build circuit construction skills using different circuit element. 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   The basic laws for different circuits.

II The elementary experimental and modeling skills for handling problems with electrical machines in the industries and domestic applications to excel in professional career.

III The intuitive knowledge needed to test and analyze the performance leading to design of electric machines by conducting various tests and calculate the performance parameters.

IV Gain knowledge on semiconductor devices like diode and transistor.

V   Interpret different transistor configurations.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO 1 **Analyze** an electric circuit using Ohm's and Kirchhoff's laws.   Analyze

CO 2 **Analyze** the performance characteristics of DC shunt machine at various loading   Analyze
conditions.

CO 3 **Examine** the performance of single-phase transformers, induction motors and alternator by   Understand
conducting a suitable test.

CO 4 **Acquire** basic knowledge on the working of PN-junction diode, Zener diode to plot their   Understand
V-I characteristics.

CO 5 **Identify** transistor configuration and their working to deduce its working as switch and   Apply
amplifier.

IV. SYLLABUS:

LIST OF EXPERIMENTS

Expt - 1	KIRCHOFF'S CURRENT LAW AND VOLTAGE LAW

Verification of Kirchhoff's current and voltage laws.

Expt - 2	OHM' S LAW

Verification of Ohm's law.

Expt - 3	OPEN CIRCUIT CHARACTERISTICS OF DC SHUNT GENERATOR

Study the magnetization characteristics of DC shunt generator.

Expt - 4	SWINBURNE'S TEST
Predetermination of efficiency (Swinburne's test) of DC shunt machine.	
Expt - 5	OPEN CIRCUIT AND SHORT CIRCUIT TEST
Determination of efficiency of single phase transformer by conducting open circuit and short circuit test.	
Expt - 6	BRAKE TEST ON THREE PHASE INDUCTION MOTOR
Plot the performance characteristics of three phase induction motor by conducting brake test.	
Expt - 7	REGULATION OF ALTERNATOR
Determine the regulation of alternator using synchronous impedance method.	
Expt - 8	PN JUNCTION DIODE
Study the characteristics of PN junction diode.	
Expt - 9	ZENER DIODE
Study the characteristics of Zener diode and breakdown mechanism.	
Expt - 10	HALF WAVE RECTIFIER CIRCUIT
Determine the efficiency of, regulation of half wave rectifier circuit.	
Expt - 11	FULL WAVE RECTIFIER CIRCUIT
Determine the efficiency of, regulation of full wave rectifier circuit.	
Expt - 12	TRANSISTOR
Study the characteristics of Transistor with common emitter (CE) configuration.	
Expt - 13	TRANSISTOR
Study the characteristics of Transistor with common base (CB) configuration.	
Expt - 14	CATHODE RAY OSCILLOSCOPE (CRO)
Check the features and limitations of cathode ray oscilloscope.	
Reference Books:	
1. A Chakrabarti, "Circuit Theory", Dhanpat Rai Publications, 2004. 2. J P J Millman, C C Halkias, Satyabrata Jit, "Millman's Electronic Devices and Circuits", Tata McGraw Hill, 2nd Edition, 1998. 3. 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/	

SOFTWARE AND HARDWARE REQUIREMENTS FOR A BATCH OF 30 STUDENTS:

SOFTWARE: Microsoft Windows 7 and MATLAB – V 8.5
HARDWARE: 01 numbers of Intel Desktop Computer with 2 GB RAM