BVM ENGINEERING COLLEGE [AN AUTONOMOUS INSTITUTION]

ES104: ELECTRICAL WORKSHOP
CREDITS - 1 (LTP:0,0,1)

Course Objectives:

1. This course aims to provide Basic Electrical and Electronics Engineering concepts.
2. The main objective is to make the students able to understand, design and prepare electrical and electronics circuits using basic concepts.

Teaching and Assessment Scheme:

Teaching Scheme (Hours per week)			Credits	Assessment Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	CE	ESE	CE	
0	0	2	1	0	0	40	60	100

Course Contents:

Unit No.	Topics	Teaching Hours
1	**Measurement:** Measuring of various electrical quantities like resistance, voltage, current, frequency, phase difference, amplitude, power, power factor for a. c. supply. Use of various analog, digital meters, Signal Generator, Cathode Ray Oscilloscope and Storage CRO	
2	**Wiring:** Single phase wiring; Tube-light wiring, Staircase wiring etc, Measurement of earthing resistance using megger.	
3	**Constructional Features:** Demonstration of construction & maintenance of electrical machines; appliances like fan, air- conditioner, refrigerators, UPS, Personal Computer etc.	
4	**Protective Devices:** Testing of characteristics of Fuse, MCB, and ELCB for a given Circuit.	
5	**Layout and Drawing:** Study of layout and circuit diagram of electrical wiring installation, panels and distribution boards of multi-storied buildings using IEEE Electrical symbols.	
6	**Rating and Specifications:** Comparison of ratings and specification of various electrical circuit components and devices like motors, transformers, appliances and power supplies	
7	**Electrical Safety Standards:** Electrical safety standards, equipment and practices.	

8 Introduction to Electronics Components:

Resistor, Capacitor, Inductor, Diode, LEDs, Transistor, MOSFET, Thyristor, Relays, Op-Amp, ICs, Breadboard etc. Soldering techniques.

9 Hands-on Soldering Techniques and PCB Design:

Soldering and testing. Simulation of the same experiment using Open Source software like Eagle, EasyEDA, Kicad, LTspice etc.

10 Introduction to Proteus Software:

Basic circuit design for embedded systems with simulation of microcontroller along with program implementation and output check

Total

List of References:

1. P. Tiwari, S. Gairola, "*Electrical Engineering Laboratory Practice*", S. K. Kataria Publication
2. P K Kharbanda, S B Bodkhe, S D Naik and S G Tarnekar, *"Laboratory Courses in Electrical Engineering"*, 5/e, S. Chand Publishing
3. Dr. V. Ganesh and Dr. K. Venkat Reddy, *"Electrical Machines Lab Manual/Student Hand Book"*, Mudranik Technologies Pvt. Ltd.
4. B. L. Theraja, Volume- II, *"Electrical Technology"*, S. Chand
5. Jean Andrews; "Enhanced Guide to managing and maintain your PC", Edition , 2001, Course Technology – Thomso n learning publishers

Course Outcomes (COs):

At the end of this course students will be able to …

1. Design and develop Basic electrical and electronic circuits.
2. Explain use of different electrical measuring Instruments and different safety standards.
3. Test the characteristics of protective devices.
4. Demonstrate the construction of electrical machines and connection for different Electrical wirings.
5. Classify different instruments and rating for the same.
6. Design, develop and prepare printed circuit board for electronic and microcontroller based circuits using software.