

**Title:** Electrical Workshop Practice

**Code Number:** EE1104

**Credit Hours:** 1 (0+1)

**Prerequisites:** Nil

**Semester:** 1<sup>st</sup>

### **Course Objectives**

The course will enable students to:

1. Demonstrate proper use of safety equipment and adherence to safety regulations in workshop practices, including handling tools and safety gear.
2. Execute precision measuring tools such as vernier calipers, micrometers, and thread pitch gauges proficiently to accurately measure and prepare work pieces.
3. Operate with cables, switches, plugs, circuit breakers, fuses, and symbols used in electrical wiring schematics.
4. Construct parallel electric wiring circuits according to wiring regulations, incorporating earthing concepts and installation of earthing cables for electrical safety.
5. Produce PCB using circuit design software like Proteus, including the processes of designing circuits, simulating them, and producing a functional PCB through etching and fabrication techniques.

### **Contents**

#### **Unit 1: Workshop safety**

1. Demonstration of safety equipment
2. Tools and safety gear in accordance with safety regulations
3. Electric shock treatment.

#### **Unit 2: Measurements**

1. Vernier calipers
2. Micrometer
3. Thread pitch gauge
4. Familiarization with different bench fitting tools and equipment
5. Preparation of Work Piece

#### **Unit 3: Preparation of work pieces**

1. Joining of metal work pieces in lap,
2. Butt and t-joints using electric arc welding

#### **Unit 4: Familiarization with Lathe Machine**

1. Introduction to a lathe machine its parts
2. Accessories, and operations

#### **Unit 5: Familiarization with Electric Cables and Switching Devices**

1. Familiarization with the types of cables and electric accessories
2. Switches
3. Plugs
4. Circuit breakers
5. Fuses
6. Symbols for electrical wiring schematics.

### **Unit 6: Wiring Circuits & Earthing Concepts**

1. Wiring regulations.
2. assembling a parallel electric wiring circuit,
3. Earthing concepts
4. Installation of an earthing cable
5. Assembling and disassembling of a computer system
6. Assembling and disassembling of a modern computer system along with its accessories.

### **Unit 7: Introduction to Circuit designing & PCB Printing**

1. Introduction to circuit designing and simulation using Proteus.
2. Introduction to PCB printing (Fabrication of a PCB) and etching in PCB design.
3. Demonstration and evaluation of a complete PCB design and fabrication.

### **Unit 8: Open Ended Lab or Semester Project:**

Students will do a project in the last three weeks to summarize the technical knowledge and skills learnt in Electrical Workshop Practice and prepare a report

#### **Teaching-Learning Strategies:**

The workshop practice lab employs hands-on teaching methods in a practical, interactive setting. It utilizes multimedia tools and whiteboards for instruction. Participants actively engage in solving real-world problems using tools, fostering practical skills and application-based learning.

#### **Assignments/Types and Number with calendar:**

A minimum of four assignments to be submitted before the written exams for each term.

#### **Assessment and Examinations:**

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	It takes place at the mid-point of the semester.
2.	Sessional Assessment	25%	It is continuous assessment. It includes classroom participation, attendance, assignments and presentations, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3.	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

#### **Recommended Books:**

1. Umesh Rathore and Naresh Kumar Sharma, "A Textbook of Electrical Workshop Practices", S.K. Kataria & Sons, 1st Ed. 2019
2. S. K. Choudhury, "Elements of Workshop Technology", Vol. 1, Media Promoters & Publishers.
3. Chapman, "Workshop Technology", Part-I, II, III, CBS