

| Course Code | Course Name | Credits |
|---------------|--|-----------|
| MTL303 | Electrical and Electronics Workshop | 01 |

Objectives

1. To introduce the basic laboratory instruments and household electrical & electronic equipments
2. To design PCB and develop small circuits
3. To understand working of different network simulation softwares

Outcomes: Learner will be able to...

1. Understand working of different lab equipment
2. Demonstrate skills in handling electrical components
3. Repair and do maintenance of households appliances.
4. Demonstrate PCB design and soldering skills
5. Understand working of different parts of Computer
6. Simulate Electrical networks using software techniques.

PART A

List of laboratory Work:

| Exp No. | Name of the Experiment and content |
|---------|---|
| 1 | Study of construction and operation of different lab equipment : Introduction to different equipment in the lab (multi-meter, CRO, DSO, power supplies, function generators); Resistors, presets, potentiometers, inductors (iron core and ferrite core), capacitors of different ratings. |
| 2 | Introduction to Household electrical wiring Wiring materials, selection of wire, different switching and protection devices (MCBs/ Fuses/Relays), Cables and cable management Estimation and costing of residential wiring (Simple numerical on wiring of single room), connection of energy meter and distribution board, wiring standards (IS-732, section 4) |
| 3 | Repair of house hold appliances and machines: Testing, fault finding, Dismantling, assembling and testing after repairs of house hold appliances like fan and regulator, heater, geyser, mixer, washing machine, microwave oven etc |
| 4 | Hardware implementation of Electronics circuits: Soldering techniques and equipments, PCB Layout (artwork) design using software and Fabrication printing process. Testing and debugging process of assembled circuits. Making small Switching circuits using electronic components. |
| 5 | Study of Computer hardware. Functional block diagram, unmounting computer CPU, study internal structure of Computer parts. |
| 6 | Introduction to simulating Softwares Study different simulating softwares like Qucs, Scilab, Matlab. Simulation of small networks using it. |
| 7 | Study of ICT(In circuit Test) and FCT (Function Test) Fixture in electronic mass production. Test Systems architecture, Automated testing, Types of contact, Bead probe technology , Types of probes, Tip styles, Fixture components, Actuation and hold down mechanisms |

Any other experiment based on syllabus which will help students to understand topic/concept.

Books Recommended:

1. J. B. Gupta "Electrical Installation Estimating & costing" S. K. Kataria& Sons, 2009
2. K.B. Raina, S.K. Bhattacharya "Electrical Design Estimating and Costing", New Age Inter. 2018
3. Alagappan N. &Ekambaram S. Electrical Estimating & costing Tata McGraw hill Ltd.
4. S.L. Uppal and G.C. Garg "Electrical Wiring Estimating and Costing" Khanna Publishers 1987
5. Surjit Singh "Electric Estimating and Costing" DhanpatRai & Co. (P) Limited (2016)
6. K B. Bhatia "Study of Electrical Appliances and Devices" Khanna Publishers
7. John T. Bateson "In Circuit Testing" Springer 2012

PART B**Industrial Visit**

One compulsory visit to any Electrical Machines or Electronics Equipments Manufacturing Industry

Term Work: It comprises both part A and B

Term work consists of performing minimum 06 practical as mentioned above. Final certification and acceptance of the term work ensures satisfactory performance of laboratory work.

The distribution of marks for term work shall be as follows:

- Laboratory work (Experiment/journal) : 15 marks.
- Industrial Visit Report : 05 marks.
- Attendance : 05Marks

End Semester Examination:

Pair of Internal and External Examiner should conduct Oral on the entire syllabus of the laboratory.

