# ELECTRICAL WORKSHOP

| Course Code | 20SO8352 | Year | II | Semester(s) | I |
|---|---|---|---|---|---|
| Course Category | Skill oriented | Branch | EEE | Course Type | Skill Oriented Course |
| Credits | 2 | L-T-P | 1-0-2 | Prerequisites | Basic Electrical & Electronics Engineering |
| Record/ Report | 15 | Viva Voce | 35 | Total Marks: | 50 |

| Course Outcomes | |
|---|---|
| Upon successful completion of the course, the student will be able to | |
| CO1 | **Understand** various tools, identify and measure electrical components and quantities.(L2) |
| CO2 | **Demonstrate** the wiring of various electrical circuits(L2) |
| CO3 | **Apply software tools for** Electrical Circuits analysis (L3) |
| CO4 | **Measurement** of illumination from light source (L2) |
| CO5 | **Learn various** electrical safety measures and First Aid activities (L3) |
| CO6 | **Submit a report** based on experiments |

**Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | | | | | | | | | | | | | | |
| CO2 | 3 | 3 | 3 | 3 | | 3 | 3 | | 3 | 3 | | | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 | | | 3 | 3 |
| CO4 | 2 | 2 | 2 | 2 | | 2 | 2 | | 2 | 2 | | | 2 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 | | | 3 | 3 |
| CO6 | 3 | | | | 3 | | | | 3 | 3 | | | | |

**Syllabus**

| Unit No. | Contents | Mapped CO |
|---|---|---|
| I | **Electrical Wiring & Testing**<br>Study of various electrical tools and symbols- Identify different types of cables/wires and switches, fuses & fuse carriers -Fundamental of MCB and ELCB, MCCB -Measurement of earth resistance - common faults and trouble shooting of household appliances - Wiring of backup power supply- Calculation of Loads and design of its related components. | CO 1, CO 2, CO 6 |
| II | **Electrical Circuit Design and verification in MATLAB**<br>Basic Electrical circuit design with R, RL, RC, Design, Simulate and Verification of KVL , KCL Thevenin's & Norton's theorems in MATLAB/Simulink. | CO 3, CO 6 |

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|---|---|---|
| **III** | **Illumination**<br>Study of Sources of lights- Incandescent lamps, Florescent tubes, Compact Fluorescent lamp, LED lamp, Comparison of Electrical Power consumption. | CO 4, CO 6 |
| **IV** | **Electrical Safety and Precautions**<br>Importance of Neutral and Grounding- Precautions from electric shock and methods of First Aid for Electric Shock Treatment - Source of Fire in electrical systems - quenching the fire - Practicing with Fire extinguisher - Working and operation of Extinguisher. | CO 5, CO 6 |

| Ex.No | List of Experiments | Mapped CO |
|---|---|---|
| **1** | Demonstration of various electrical tools and symbols | CO1,CO 6 |
| **2** | Identify different types of cables/wires and switches, fuses & fuse carriers, MCB and ELCB, MCCB with ratings and usage | CO 1,CO 6 |
| **3** | Measurement of Earth resistance and testing of cables | CO 1,CO 6 |
| **4** | Wiring of light/fan circuit using two way control (Staircase wiring | CO 2,CO 6 |
| **5** | Wiring of backup power supply including Diesel Generator, inverter with changeover. | CO 2,CO 6 |
| **6** | Load calculation for household/Industrial appliances and selection of related components | CO 2,CO 6 |
| **7** | Simulation and verification of KVL and KCL law (DC circuits) using MATLAB. | CO 3,CO 6 |
| **8** | Response of an RLC circuit by parametric analysis using MATLAB | CO 3,CO 6 |
| **9** | Measurement of illumination using Lux meter | CO 4,CO 6 |
| **10** | Study of various Electrical safety measures and First Aid for shock treatment | CO 5,CO 6 |
| **11** | Understanding the operation of Fire extinguishers and utilization of the Fire extinguisher | CO 5,CO 6 |

## References

**Learning Resources**

**Text Books**


1. J.B.Gubta, "Utilization of Electric Power & Electric Traction", S.K. Kataria & Sons publications, 2013
2. Dr. Shailender Gupta & Bharat Bhushan, "An Insight to Matlab & Simulink", S.k. Kataria publications, 2017
3. A. El-Sharkawi, "Electric Safety:Practice And Standards", T&F India publications, 2020


**Reference Books**


1. K. B. Raina, "Electrical Design Estimating and Costing", New Age International Private Limited publications, 2017
2. Sulaymon Eshkabilov, "Beginning MATLAB and Simulink: From Novice to Professional", **Apress publications, 2019**


**e- Resources & other digital material**

1. https://in.mathworks.com/
2. https://www.firstaidforfree.com/fire-safety-advice-first-aiders/