

**SEWAK TRAINING**  
**CENTER, GURUGRAM**

**MANUAL:-ELECTRICAL COURSE**

## **CRITERIA OF ADMISSION: -**

### **➤ Basic Electrical Level – I.**

Minimum Eligibility : - Nil , 10<sup>th</sup> ,12<sup>th</sup>.

Minimum Age : - 18 To 40 Years.

Experience In Field : - Fresher.

Duration Of Course : - 3 Months.

### **➤ Advance Electrical Level – II.**

Minimum Eligibility :- 5<sup>th</sup>, 10<sup>th</sup>, 12<sup>th</sup>, Certification, I.T.I.

Minimum Age :- 18 To 40 Years.

Experience In Field :- Minimum One Year. Or above.

Duration Of Course :- 3 Months.

## **DOCUMENTS FOR ADMISSION: -**

- Certification. (s. 1 .c, provisional, school id card 10<sup>th</sup> ,12<sup>th</sup> or i.t.i certificate)
- Aadhar Card.
- Voter Id.
- License, etc.
- PassPort Size Colour Photo. 2.

### **➤ CERTIFICATIONS: -**

#### **➤ Two Types of Certifications.**

1. Participation Certification.
2. Qualify by Grading, Certification with Barcode.

# **SYLLABUS OF ELECTRICAL COURSE:**

**3-month syllabus outline for studying Electrical Systems, Lighting, and Home Appliances. The plan is divided into weekly topics, balancing theory and practical skills.**

## **❖ Month 1: Electrical Systems.**

### **1. Week: Basic Electrical Theory.**

- Ohm's Law, Kirchhoff's Laws.
- Electrical units: voltage, current, resistance, power.
- Series and parallel circuits.
- Advanced concepts in AC and DC circuits.
- Complex circuit analysis: mesh and nodal analysis.
- Power factor correction and reactive power.

### **2. Week: Electrical Components.**

- Resistors, capacitors, inductors.
- Transformers, diodes, transistors.

- Circuit breakers and fuses.
- Principles of smart grids and their components.
- Integration of renewable energy sources (solar, wind).
- Energy storage systems (batteries, supercapacitors).

### **3.Week: Wiring and Installation Practices.**

- Types of wiring systems.
- Electrical code basics.
- Safety practices and tools.
- Semiconductor devices (IGBTs, MOSFETs).
- Power electronics and their applications.
- High-efficiency transformers and inductors.

### **4. Week: Electrical Measurements and Testing.**

- Multimeters usage.
- Oscilloscope basics.
- Electrical troubleshooting techniques.
- Programmable Logic Controllers (PLCs) and their applications.
- Industrial control systems and SCADA.
- Remote monitoring and control systems.

### **❖Month 2: Lighting Systems.**

## **1. Week: Lighting Fundamentals.**

- Types of lighting: incandescent, LED, fluorescent, halogen.
  - Colour temperature and CRI (Colour Rendering Index).
  - Luminous efficacy and lumen output.
  - OLED and Micro LED technologies.
  - High-performance LEDs and advanced drivers.
- Intelligent lighting systems and tunable white light.

## **2. Week: Lighting Design Principles.**

- Lighting for different environments (residential, commercial).
- Light distribution and beam angle.
- Energy-efficient lighting practices.
- Using software for lighting simulation (Dia lux, Reflux)
- Advanced photometric analysis and light quality metrics
- Dynamic lighting design for human-centric and circadian rhythms.

## **3. Week: Control Systems for Lighting.**

- Manual vs. automated controls.
- Dimming systems, timers, and sensors.
- Smart lighting technologies and integration.
- DALI (Digital Addressable Lighting Interface) and DMX (Digital Multiplex).
- IoT-based lighting control and management.
- Integration with building management systems (BMS).

## **4. Week: Practical Lighting Projects**

- Designing a lighting plan.
- Installing and wiring different types of fixtures.
- Evaluating and adjusting lighting setups.
- Smart lighting for energy savings and reduction of light pollution
- Life Cycle assessment of lighting technologies
- Design and implementation of energy-efficient lighting projects.

## ❖ **Month 3: Advanced & Smart Home Appliances.**

### **1. Week: Advanced & Smart Home Appliances.**

- Types of home appliances: refrigerators, washing machines, ovens, etc.
- Operating principles and energy consumption.
- Basic troubleshooting techniques.
- Overview of smart home ecosystems (Google Home, Amazon Alexa).
- IoT protocols and communication standards (ZigBee-Wave, Wi-Fi).
- Integration and security concerns of smart appliances.

### **2. Week: Appliance Repair and Maintenance.**

- Advanced repair and customization of smart appliances.
- Common faults and their remedies.
- Disassembly and reassembly.
- Routine maintenance practices.
- Energy management and optimization in home appliances.
- Diagnostics and troubleshooting of smart appliances.

### **3. Week: Energy Efficiency and Smart Appliances.**

- Energy Star ratings and efficiency standards.
- Integration of smart appliances with home automation systems.
- Understanding appliance power ratings and their impact on energy bills.
- Development trends in appliance design and functionality.
- Impact of artificial intelligence and machine learning on home appliances.
- Advanced materials and technologies (self-cleaning surfaces, touchless controls).

### **4. Week: Hands-On Projects and Review.**

- Comprehensive review of electrical systems, lighting, and appliances.
- Hands-on projects, including installation and troubleshooting.
- Assessment and final evaluations.
- Designing and implementing a smart home system.
- Review and assessment through practical projects and simulations.

**1. This syllabus should provide a solid foundation in the topics you're interested in, combining theoretical knowledge with practical experience. Adjustments may be needed based on specific goals or prior knowledge.**



# **ASSESSMENT CRITERIA: -**

**Assessment criteria can be structured around the following key areas:**

## **1. Theoretical Understanding:**

- Knowledge of electrical principles and safety standards.
- Understanding of different types of lighting technologies (incandescent, LED, CFL, etc.).
- Familiarity with various home appliances and their functions.

## **2. Technical Skills:**

- Ability to read and interpret electrical diagrams and schematics.
- Competence in wiring and installation of lighting systems and home appliances.
- Proficiency in troubleshooting and diagnosing issues with electrical systems.

## **3. Practical Application:**

- Demonstrated ability to install, maintain, and repair lighting fixtures and home appliances.
- Application of knowledge in practical scenarios, such as designing a lighting layout or configuring an appliance.

#### **4. Safety and Compliance:**

- Adherence to electrical safety standards and codes.
- Understanding of regulatory requirements for electrical installations and appliances.

#### **5. Project Work:**

- Successful completion of a project involving the installation or repair of a lighting system or appliance.
- Presentation of a project report that includes planning, execution, and outcomes.

#### **6. Problem-Solving Skills:**

- Ability to address and resolve real-world issues related to electrical lighting and home appliances.

#### **7. Communication and Documentation:**

- Clear documentation of installation processes, maintenance schedules, and troubleshooting steps.
- Effective communication of technical information and solutions.

**This structure ensures that students or trainees are assessed comprehensively on their knowledge, skills, and application abilities in the domain of electrical lighting and home appliances.**

**Here are some common rules and regulations that might be implemented in a electrical training institute to ensure a productive, safe, and respectful learning environment: -**

## **❖ Institute Rules and Regulations: -**

### **➤ General Conduct.**

#### **1. Respect and Courtesy: -**

- Treat all students, staff, and visitors with respect and courtesy.
- Harassment, bullying, or discrimination of any kind will not be tolerated.

#### **2. Attendance and Punctuality: -**

- Attend all classes and practical sessions as scheduled.
- Arrive on time; lateness may result in disciplinary action.
- Inform the administration in advance if you are unable to attend a session.

#### **3. Dress Code: -**

- Wear appropriate clothing for practical sessions, including required personal protective equipment (PPE).
- Adhere to any specific dress codes outlined by the institute.

#### **4. Behaviours:**

- Maintain professional behaviours at all times.
- Refrain from disruptive behaviours during classes and practical sessions.
- Follow instructions given by instructors and staff.

### **➤ Safety Regulations: -**

#### **5. Safety First: -**

- Follow all safety protocols and procedures.
- Use tools and equipment safely and responsibly.
- Report any safety hazards or incidents to an instructor immediately.

#### **6. Personal Protective Equipment (PPE): -**

- Wear PPE as required, including safety glasses, gloves, and protective footwear.
- Keep PPE in good condition and replace it when necessary.

### **➤ Academic Integrity: -**

#### **7. Honesty: -**

- Complete all assignments, tests, and exams honestly.
- Do not engage in cheating, plagiarism, or any form of academic dishonesty.

#### **8. Assignments and Projects: -**

- Submit all assignments and projects by the deadlines set by instructors.

- Ensure all work submitted is your own and properly cite any sources used.

### **➤ Facility Use: -**

#### **9. Care for Institute Property: -**

- Use institute property, including tools and equipment, responsibly.
- Do not damage or misuse institute property; report any damage immediately.

#### **10. Cleanliness: -**

- Keep classrooms, workshops, and common areas clean and tidy.
- Dispose of waste properly and clean up after yourself.

### **➤ Technology Use: -**

#### **11. Responsible Use of Technology: -**

- Use institute computers and internet access for educational purposes only.
- Do not access inappropriate or unauthorized websites.

#### **12. Mobile Phones and Devices: -**

- Keep mobile phones on silent mode during classes and practical sessions.
- Use mobile devices only when permitted by the instructor.

### **➤ Disciplinary Procedures: -**

### **13. Consequences: -**

- Violations of institute rules may result in warnings, suspension, or expulsion, depending on the severity of the offense.
- Repeated offenses will lead to more severe disciplinary actions.

### **14. Appeals: -**

- Students have the right to appeal disciplinary actions through a formal process outlined by the institute.

### **➤ Additional Guidelines: -**

#### **15. Feedback and Suggestions: -**

- Provide constructive feedback and suggestions to help improve the institute's programs and facilities.

#### **16. Participation in Activities: -**

- Engage actively in institute events, workshops, and extracurricular activities to enhance your learning experience.

**These rules and regulations are designed to create a safe, respectful, and productive learning environment for all students and staff at the plumbing training institute. Adherence to these rules will help ensure a positive experience and successful completion of the program.**