

## ELECTIVE MODULE FOR NORMAL (TECHNICAL) STUDENT

Module Title                      **Residential Electricity**                      Duration: **30 hour**

Pre-requisite:                      NIL

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### **Aim of Module**

- (1) To provide students with better understanding of how electricity is being use at home.
- (2) To understand the dangers of electricity and how to use it safety at home.

### **Learning Outcomes**

At the end of the module, students will be able to:

1. Inculcate a sense for electrical safety.
2. Explain the function of various safety devices in a house.
3. Calculate electricity consumption of home appliances.
4. Design simple electrical wiring circuit for residential use.
5. Use of basic tools and measuring instrument.

### **Module Outline**

Students will learn the fundamentals about the hazard of electricity and how to use it safety at home. They will visually troubleshoot simple faults that may arise in electrical installation. They will also design and connect up simple electrical installations.

### **Outline of Module Syllabus**

<b><u>Item</u></b>	<b><u>Technical Skills / Knowledge</u></b>	<b><u>Instructional Hours</u></b>
<b>1</b>	<b>Electricity Generation</b> <ul style="list-style-type: none"><li>➤ Explain how electricity is generated.</li><li>➤ Describe the transmission and distribution of electricity from power stations to homes.</li></ul>	<b>1</b>
<b>2</b>	<b>Basic Electrical Quantities and Units</b> <ul style="list-style-type: none"><li>➤ Understand the following basic terms used in electricity</li><li>➤ Describe the differences between a direct current (DC) supply and an alternating current (AC) supply.</li></ul>	<b>1</b>
<b>3</b>	<b>Electrical Safety and Protection</b> <ul style="list-style-type: none"><li>➤ Identify the hazards that can arise from the use of electricity.</li><li>➤ Describe the safety precautions that must be taken when working with electricity.</li><li>➤ Describe the function and operation of electrical protective devices found in homes.</li><li>➤ Explain the basic purpose of earthing electrical appliances</li></ul>	<b>4</b>

- and installations.
- Appreciate the need to have a set of regulations and codes of practices for electrical installations.

**4 Basic Test Equipment 3**

- Describe the working principle and application of a test pen.
- Use a test pen to detect the presence of an electrical voltage.
- Describe the various functions and uses of a multimeter.
- Use a multimeter for checking electrical faults.

**5 Electrical Faults 2**

- Describe the common types of electrical faults that can occur in electrical appliances and circuits:
  - Short circuit
  - Open circuit
  - Overload
  - Grounded

**6 Electrical Systems 17**

- Describe the common types of electrical cables used in homes.
- Identify the different kinds of electrical accessories and electrical loads in homes.
- Describe the basic factors that must be considered when selecting switches, fuses and circuit breakers in relation to the electrical loading.
- Describe the procedure for connecting electrical plugs
- Connect a 13 a fused plug and a 15A plug.
- Connect a lighting circuit with a single-way switch and two-way switches.
- Identify the major components of a conventional fluorescent lamp circuit.
- Explain the function of the major components of a fluorescent lamp circuit.
- Describe the working principle of a fluorescent lamp circuit.
- Connect a fluorescent lighting circuit.
- Connect a radial connected 13A switched socket outlet.
- Connect a ring connected 13A switched socket outlet.
- Connect up a 15A switched socket outlet.
- Connect a consumer unit.

**7 Electricity Tariffs 2**

- Describe the concept of electrical power and energy.
- Describe typical power rating of home appliances such as electric kettles, iron, ovens and water heaters.
- Describe the measurement unit of electricity consumption in the home.

- Calculate the cost of electricity used by an appliance.

### **Teaching and Learning Approaches**

This elective is a practical orientated module. Students will understand the basic concept through experiential learning

### **Completion Criterion**

Students will be deemed to have successfully completed the module if they pass all the assessments. The guidelines for the assessments are given below.

<b>S/N</b>	<b>Assessment Component</b>	<b>Assessment Guidelines</b>	<b>Weighting</b>
1	Practical Assignment 1	Students able to connect 13A plug <b>AND</b> ring or radial power circuit correctly	30%
2	Practical Assignment 2	Students able to connect fluorescent lighting circuit correctly.	30%
3	Practical Test	Students to install, connect and test lighting circuit with 2-way control correctly	40%
		<b>Total</b>	<b>100%</b>

### **Target Audience**

Sec 3 / 4 Normal (Technical) students

### **Class Size**

20 students per class

### **Duration**

30 instructional hours

### **Certification**

ITE Certification of Attendance will be issued upon successful completion of the course. ITE Certificate of Achievement will be issued upon students meeting the assessment criteria.