Republic of Rwanda
Ministry of Education

RTB | RWANDA TVET BOARD

BASIC ELECTRICITY

WOTBE301

DEMONSTRATE KNOWLEDGE OF BASIC ELECTRICITY

Competence

RQF Level: 3

Learning Hours: 30

Credits: 3

Sector: Agriculture and Food Processing

Trade: Wood Technology

Module Type: General

Curriculum: AFPWOT3002- TVET Certificate 3 in Wood Technology

Issue Date: June 2022

<table>
<tr><td>Purpose statement</td><td colspan="5">This complementary competence describes skills, knowledge and right attitudes to acquire fundamental understanding to define voltage, current, capacitance and resistance and explain the characteristics, Make basic circuit measurements utilizing a voltmeter, a current meter, an ohmmeter and Determine the characteristics of a series and parallel circuit.</td></tr>
<tr><td rowspan="6">Delivery modality</td><td colspan="2">Training delivery</td><td>100%</td><td colspan="2">Assessment</td><td>Total 100%</td></tr>
<tr><td colspan="2">Theoretical content</td><td>30%</td><td rowspan="4">Formative assessment</td><td>30%</td><td rowspan="4">50%</td></tr>
<tr><td colspan="2">Practical work:</td><td rowspan="3">70%</td><td rowspan="3">70%</td></tr>
<tr><td>• Group project and presentation</td><td>20%</td></tr>
<tr><td>• Individual project /Work</td><td>50%</td></tr>
<tr><td colspan="3"></td><td colspan="2">Summative Assessment</td><td>50%</td></tr>
</table>

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Define voltage, current, capacitance and resistance and explain the characteristics	1.1. Voltage is well defined, applied and explained in accordance to the standard voltage.
	1.2. Current is adequately defined, applied and explained in relation to the standard current.
	1.3. Capacitance is correctly defined; applied and explained as per standard capacitance.
	1.4. Resistance is effectively defined; applied and explained comparatively to the standard resistance.
2. Make basic circuit measurements utilizing a voltmeter, a current meter, an ohmmeter	2.1. Voltage is correctly measured by using voltmeters and multi-meters
	2.2. Current is properly measured by means of an ammeter and a multi-meter
	2.3. Resistance is adequately measured by the help of ohmmeter and multi-meter
	2.4. Capacitance accurately done from measured parameters
3. Determine the characteristics of a series and parallel circuit	3.1. Series circuit is well defined, characterised, applied and explained according to the regulations.
	3.2. Parallel circuit is adequately explained and applied according to the drawing provided.
	3.3. Advantages and disadvantages of parallel and series circuits are well described

Course content

Learning outcomes	At the end of the module the learner will be able to: 1. Define voltage, current, capacitance and resistance and explain the characteristics 2. Make basic circuit measurements utilizing a voltmeter, a current meter, an ohmmeter 3. Determine the characteristics of a series and parallel circuit
Learning outcome 1: Define voltage, current, capacitance and resistance and explain the characteristics	**Learning hours: 10**

Indicative content

- **Definition of voltage**
  - ✓ What is voltage
  - ✓ Units of voltage
  - ✓ Local voltage supply
  - ✓ 3 phase and single phase
  - ✓ Characteristics of voltage
  - ✓ How voltage works
- **Definition of current**
  - ✓ What is current
  - ✓ Units of current
  - ✓ Types of current
    - Describe Direct current (DC)
    - Describe alternating current (AC)
- **Definition of capacitance**
  - ✓ What is capacitance
  - ✓ Importance of capacitance
  - ✓ Units of capacitance
  - ✓ Application of capacitance
- **Definition of resistance**

- ✓ What is resistance
- ✓ Units of resistance
- ✓ What causes resistance
- ✓ Effects of resistance
- ✓ Application of resistance

Resources required for the learning outcome	
Equipment	• Ohmmeter • Multimeter • Voltmeter • Ammeter • PPE • Computer • Internet • Projector
Materials	• Wire • Dry cells battery • Resistors
Tools	• Tester • Screw driver
Facilitation techniques	• Group discussion • Trainer guided • Lectures • Demonstration and simulation • Individual and group work • Practical exercise on identification of woody plants • Group discussion
Formative assessment methods	• Written assessment • Performance assessment

Learning outcome 2: Make basic circuit measurements utilizing a voltmeter, a current meter, an ohmmeter	Learning hours: 10

Indicative content

- **Measuring of voltage**
  - ✓ Identify features in a voltmeter and multimeter
  - ✓ -electrodes (+ve and –ve)
  - ✓ Describe function of the scales in voltmeter
  - ✓ Use voltmeter to measure voltage
  - ✓ Use multimeter to read voltage
- **Measuring current**
  - ✓ Identify scales in ammeter
  - ✓ Describes the features of the ammeter
  - ✓ Use ammeter to measure current
  - ✓ Use multimeter to measure current
- **Measuring resistance**
  - ✓ Identify features and scales in ohmmeter
  - ✓ Use ohmmeter to measure resistance
  - ✓ Use multimeter to measure resistance
- **Estimate capacitance of gadgets**
  - ✓ Relate the capacitance to corresponding
    - Voltage
    - Current
    - Resistance

Resources required for the indicative content

Equipment	• Ohmmeter • Multimeter • Voltmeter • Ammeter • PPE • Computer

	• Internet • Projector
Materials	• Wire • Dry cells battery • Resistors • Charts and diagrams • Flipchart • Markers
Tools	• Tester
Facilitation techniques	• Lectures • Demonstration and simulation • Individual and group work • Practical exercise • Individualized • Trainer guided • Group discussion
Formative assessment methods	• Written assessment • Performance assessment

Learning outcome 3: Determine the characteristics of a series and parallel circuit	**Learning hours: 10**
Indicative content	
• **Description of series circuit** ✓ Arrangement of series circuits ✓ Diagrams of series connection ✓ Application of series circuit • **Description of parallel circuit** ✓ Arrangement of parallel ✓ Diagrams of parallel circuit ✓ Application of parallel circuit • **Description of advantages of series and parallel circuits**	

✓ Advantages of series circuits ✓ Disadvantages of series circuit ✓ Advantages of parallel circuits ✓ Disadvantages of parallel circuits	
Resources required for the indicative content	
Equipment	• Ohmmeter • Multimeter • Voltmeter • Ammeter • PPE • Computer • Internet • Projector or
Materials	• Charts and diagrams • Flipchart • Markers
Tools	
Facilitation techniques	• Lectures • Demonstration and simulation • Individual and group work • Practical exercise • Individualized • Trainer guided • Group discussion
Formative assessment methods	• Written assessment • Oral presentation • Performance assessment