

BASIC ELECTRONICS

UNIT CODE: ICT/CU/CS/CC/01/6/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Apply Basic Electronic Skills

Duration of Unit: 170 hours

Unit description

This unit specifies the competencies required to apply basic electronics skills. It involves identifying electric circuits and electronic components, understanding semi-conductor theory, identifying and classifying memories, applying number systems and binary coding and identifying emerging trends in electronics.

Summary of Learning Outcomes

1. Identify electric circuits
2. Identify Electronic components
3. Understand Semi-conductor theory
4. Identify and classify memory
5. Apply number systems and binary coding
6. Identify emerging trends in electronics

Learning outcomes	Content	Suggested Assessment Methods
1. Identify electrical circuits	<ul style="list-style-type: none">• Definition of electrical circuit.• Basic electrical quantities and their units<ul style="list-style-type: none">✓ E.m.f in volts✓ Current in Amperes✓ Power in watts✓ Energy in joules✓ Resistance in ohms• Types of electrical circuits<ul style="list-style-type: none">✓ Simple a.c circuits✓ Simple d.c circuits	<ul style="list-style-type: none">• Practical exercises• Written• Observation• Oral
2. Identify electronic components	<ul style="list-style-type: none">• Identification of electronic components<ul style="list-style-type: none">✓ Resistor✓ Capacitor✓ Diode✓ Inductor	<ul style="list-style-type: none">• Practical exercises• Written• Observation• Oral

	<ul style="list-style-type: none"> • Characteristic of electronic components. • Application of electronic components. • Identification of integrated circuit characteristics 	
3. Understand semi-conductor theory	<ul style="list-style-type: none"> • Definition of semiconductor and related terms <ul style="list-style-type: none"> ✓ Atom ✓ Atomic structure • Description of the structure of matter <ul style="list-style-type: none"> ✓ • Explanation of electrons in conductors and semiconductors • Types of semiconductors materials <ul style="list-style-type: none"> ✓ Silicon ✓ germanium • Explanation of P-type and N-types materials <ul style="list-style-type: none"> ✓ P-type ✓ N-type • Description of P-N junction diodes operations <ul style="list-style-type: none"> ✓ Forward biasing ✓ Reverse biasing • Operations of transistors <ul style="list-style-type: none"> ✓ PNP type ✓ NPN type 	<ul style="list-style-type: none"> • Practical exercises • Written • Observation • Oral
4. Identify and classify memory	<ul style="list-style-type: none"> • Definition of memory • Classification of memories <ul style="list-style-type: none"> ✓ RAM ✓ ROM ✓ DAM • Types of memories <ul style="list-style-type: none"> ✓ Semiconductor memories ✓ Magnetic memories 	<ul style="list-style-type: none"> • Written • Observation • Oral

<p>5. Apply number systems and binary coding</p>	<ul style="list-style-type: none"> • Definition of number system and binary code • Types of number systems <ul style="list-style-type: none"> ✓ Decimal ✓ Binary ✓ Octal ✓ Hexadecimal • Base conversion • Binary arithmetic <ul style="list-style-type: none"> ✓ Addition ✓ Subtraction ✓ Multiplication ✓ Division • Binary codes <ul style="list-style-type: none"> ✓ 8421 BCD ✓ Excess-3 • Represent decimal numbers in BCD • BCD arithmetic <ul style="list-style-type: none"> ✓ Addition ✓ Subtraction ✓ Multiplication ✓ Division 	<ul style="list-style-type: none"> • Written • Observation • Oral
<p>6. Emerging trends in Electronics</p>	<ul style="list-style-type: none"> • Description of emerging trends • Explanation of challenges of emerging trends • Coping with the emerging trends 	<ul style="list-style-type: none"> • Written • Observation • Oral

Suggested Methods of Instruction

- Presentations and practical demonstrations by trainer;
- Guided learner activities and research to develop underpinning knowledge;
- Supervised activities and projects in a workshop;
- Visiting lecturer/trainer from the ICT sector;
- Industrial visits.

Recommended Resources

Tools

- Screw Drivers
- Pliers
- Wire cutters
- Wire Strippers
- Clamps
- Vises

Equipment

- Voltmeter
- Ohmmeter
- Ammeter
- Multimeter
- Power supplies
- LCR meter

Materials and supplies

- Circuits
- Semiconductor materials
- Conductors e.g. copper, gold, silver
- Insulators e.g. rubber, glass, mica

easytvvet.com