

	<b>Unit ID: 2043</b>
<b>Domain</b>	<b>Instrumentation and Control</b>
<b>Title:</b>	<b>Demonstrate knowledge of basic electronic components and circuits</b>
<b>Level: 2</b>	<b>Credits: 3</b>

### **Purpose**

This unit standard is intended for those who demonstrate knowledge of basic electronic components and circuits. People credited with this unit standard are able to identify basic electronic components and their common uses, demonstrate knowledge of various electronic circuits, calculate basic electrical quantities and demonstrate knowledge of circuit boards and PCB production.

This unit standard is intended for those who work in an Instrumentation and Control industry.

### **Special Notes**

1. Entry information:
  - Prerequisite
    - *None*
2. Assessment evidence may be collected from a real or a simulated workplace in which Instrumentation and Control operations are carried out.
3. Performance of all elements in this unit standard must comply with manufacturers' specifications and workplace specific requirements.
4. Glossary of terms:
  - 'SANS' refers to South Africa National Standards
  - 'IEC' refers to International Electrotechnical Commission
5. Regulations and legislation relevant to this unit standard include the following:
  - Labour Act, No. 11, 2007.
  - Regulations relating to the health & safety of employees at work under Schedule 1 (2) of the Labour Act No.11 of 2007
  - And all subsequent amendments.
  - SANS 10142-1.
  - IEC 61360

### **Quality Assurance Requirements**

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications

Authority and the Namibia Training Authority. All approved unit standards, qualifications and national assessment arrangements are available on the Namibia Training Authority website [www.nta.com.na](http://www.nta.com.na).

## **Elements and Performance Criteria**

### **Element 1: Identify basic electronic components and their common uses**

#### **Range**

Components to be identified include but are not limited to inspection of given components, selection from a physical or pictorial display and manufacturers' data. Basic electronic components may include but are not limited to resistors, capacitors, inductors, diodes, transistors, cathode ray tube (CRT), thyristors, *transformers* and Integrated-Circuits (ICs).

#### **Performance Criteria**

- 1.1 Electronic components are identified.
- 1.2 Characteristic of components are stated.
- 1.3 Functions of various electronic components are described.
- 1.4 Drawing symbols are identified.
- 1.5 Common application is stated for each component.

### **Element 2: Demonstrate knowledge of various electronic circuits**

#### **Performance Criteria**

- 2.1 Various electronic circuits are identified.
- 2.2 Basic configurations of electronic circuits are described.
- 2.3 Functioning of different electronic circuit is stated.

### **Element 3: Calculate basic electrical quantities**

#### **Range**

Calculations may include but are not limited to circuits in series, parallel and series-parallel.

Quantities to include but are not limited to current, voltage, resistance, power values.

Calculations include but are not limited to use of Ohm's law and Kirchhoff's law.

### **Performance Criteria**

- 3.1 Electrical quantities, units and symbols are stated.
- 3.2 Current, voltage, resistance and power in a series circuit are determined.
- 3.3 Current, voltage, resistance and power in a parallel circuit are determined.
- 3.4 Current, voltage, resistance and power in a series-parallel circuit are determined.
- 3.5 Electro-motive force (emf), potential difference and internal resistances are calculated to determine the unknown quantity if two of the quantities in a circuit are known.
- 3.6 Power dissipation in various electronic circuits is calculated across individual components and the complete circuit.

### **Element 4: Demonstrate knowledge of circuit boards and PCB production**

#### **Range**

Circuit board may include but are not limited to raster boards, veroboards, soldering strips, tag raster boards and PCBs.

### **Performance Criteria**

- 4.1 Types of circuit boards used in the field of electronics are identified and described.
- 4.2 Principle of production of printed circuit board is explained.
- 4.3 Steps to produce a single printed circuit board are demonstrated.
- 4.4 Printed circuit board design is explained in terms of the impact of imaging and etching methods.

### **Registration Data**

<b>Subfield:</b>	Electrical Engineering
<b>Date first registered:</b>	13 June 2019
<b>Date this version registered:</b>	13 June 2019
<b>Anticipated review:</b>	2024
<b>Body responsible for review:</b>	Namibia Training Authority