

Unit ID: I&C05	
Domain	Instrumentation and control
Title:	Demonstrate knowledge of basic electronic components and circuits
Level: 2	Credits: 3

Purpose

This unit standard specifies the competencies required to demonstrate knowledge of basic electronic components and circuits. It includes knowledge of electronic components and their common uses, knowledge of various electronic circuits, calculation of basic electrical quantities and knowledge of printed circuit board (PCB) production. This unit standard is intended for those who work in 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 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.
 - Occupational Health and Safety Regulations No. 18, 1997 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.

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 Various 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

Subfield:	Electrical Engineering
Date first registered:	
Date this version registered:	
Anticipated review:	
Body responsible for review:	Namibia Training Authority