	Unit ID:2015
Domain	**ELECTRONICS**
Title:	**Demonstrate and apply fundamental knowledge of analogue electronics circuits**
Level: 1	**Credits: 7**

Purpose

This unit standard is intended for those who demonstrate and apply fundamental knowledge of analogue electronics circuits. People credited with this unit standard are able to identify analogue electronics components, analyse analogue circuits, sketch analogue electronics schematic diagrams and simulate analogue electronic circuits.

This unit standard is intended for people who carry out electronics tasks in an electronics industry.

Special Notes

1. Prerequisite
   - *Unit 2011 - Apply health and safety rules and regulations in electronics workplace*
   - *Unit 2012 - Plan and organise work in electronics work environment*
   - *Unit 2014 - Demonstrate introductory knowledge of circuit concepts and measurements for electronics*

2. Assessment evidence may be collected from a real workplace or a simulated workplace in which electronics operations are carried out.

3. To demonstrate competence, minimum evidence of identification of analogue electronic components, analysis of analogue circuits, sketching of analogue electronics schematic diagrams, and simulation of analogue electronics circuits (at least 50 percent of all areas in each element) is required.

4. Glossary of terms:
   - IEC 60617- International Electro-Technical Commission pertaining with Graphical Symbols for Diagrams
   - IEEE- Institute of Electrical and Electronics Engineers.
   - SI units - International System of Units
   - TINA - Toolkit for Interactive Network Analysis

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.

6. Performance of all elements in this unit standard must comply with industry standards.

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 on www.nta.com.na.

Elements and Performance Criteria

Element 1: Identify analogue electronics components

Range

Analogue electronics components include but are not limited to diodes (Zener, rectifier, LED, Schottky, signal), Bipolar junction Transistors (NPN, PNP), Field effect transistors (N-channel and P-channel), Insulated gate bipolar transistors (IGBT), unijunction transistors (UJT), operational amplifiers, 555 timers.

Performance Criteria

1.1 Analogue electronic components are identified.

1.2 Analogue electronic components pin layouts are determined from data sheet and/or by inspection.

1.3 Analogue electronic components are selected for specific application based on their advantages and disadvantages.

Element 2: Analyse analogue circuits

Range

Analogue electronics circuits to be analysed include but are not limited to rectifier circuits, transistor circuits, operational amplifier circuits and 555 timer circuits.

Performance Criteria

2.1 Types of analogue electronic circuits are determined in line with job requirements.

2.2 Measurements and/or calculations are performed for functionality of analogue electronic circuits using appropriate instruments.

2.3 Measurement and/or calculated results are recorded and interpreted.

Element 3: Sketch analogue electronics schematic diagrams

Range

Analogue electronic circuits to be sketched include rectifiers, clippers, clampers, regulators, multipliers, amplifiers and switching circuits, operational amplifier circuits, oscillator circuits, filters.

Performance Criteria

3.1 Analogue electronic components symbols used in schematic diagrams are in accordance with the IEC/IEEE standards.

3.2 Components in schematic diagrams are connected in accordance with the IEC/IEEE standards to represent a given physical circuit.

3.3 Components in schematic diagrams are sketched and labelled with values in accordance with the IEC/IEEE standard.

3.4 Circuit diagrams are captioned according to workplace standards.

Element 4: Simulate analogue electronics circuits

Range

Analogue electronics circuits to be simulated include but are not limited to rectifier circuits, transistor circuits, operational amplifier circuits and 555 timer circuits.

Simulation software includes but not limited to Proteus Design Suite, NI Multisim, Orcad, Pulsonix, Altium Designer, TINA, Pspice

Performance Criteria

4.1 Electronic analogue circuits are captured in electronic simulation software.

4.2 Virtual instruments are used for measuring circuit parameters.

4.3 Simulation results are recorded with appropriate SI units and interpreted.

4.4 Additional calculations are performed based on the recorded results when required.

Registration Data

Subfield:	Electrical Engineering
Date first registered:	29 November 2018
Date this version registered:	29 November 2018
Anticipated review:	2023
Body responsible for review:	Namibia Training Authority