

**Unit ID: 2048**

**Domain**

**Instrumentation and Control**

**Title:**

**Demonstrate knowledge of mass, weight  
and density measurement**

**Level: 2**

**Credits: 2**

### **Purpose**

This unit standard is intended for those who demonstrate knowledge of mass, weight and density measurement. People credited with this unit standard are able to demonstrate knowledge of mass, weight and density measurement.

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. The evidence required to demonstrate competency in this unit must be relevant to workplace operations.

4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' guidelines and instructions

5. Glossary of terms:

- *specifications'* refers to any, or all of the following: manufacturers' specifications and recommendations, workplace specific requirements.
- *SI units - International System of Units*

6. 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

7. 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. 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: Demonstrate knowledge of mass, weight and density measurement**

#### **Range**

Static weighing systems include laboratory weigh balances, hopper scale, weigh bridge.

Dynamic weighing systems include weigh feeders, loss-in-weight feeders, and in-motion weighing systems.

Mass devices include load cells, scales and strain gauges.

Density devices include u-tubes, displacers, nuclear gauges and refractometers.

Calibration instruments include multimeters, refractometers, and radiation survey meters.

#### **Performance Criteria**

- 1.1 Types of mass, weight and density devices are described in terms of their operation, characteristics and calibrations.
- 1.2 Radiation safety practices are described in accordance with establishment procedures.
- 1.3 The difference between static and dynamic mass/weight is stated.
- 1.4 Static and dynamic weighing systems are explained.
- 1.5 The Wheatstone bridge and strain gauge and its uses are explained.
- 1.6 The types of load cells and their uses are described.
- 1.7 The principal of operation of load cells are explained.
- 1.8 Factors affecting system performance are described.
- 1.9 Calculations related to mass, weight, density measurements and Wheatstone bridge circuit are performed and SI units used are converted.

- 1.10 Calibration methods and procedures are described with reference to calibration principles, measuring parameters and manufacturer's instructions.

### **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