

Domain	TELECOMMUNICATION AND WIRELESS TECHNOLOGY	Unit ID: 2281
Title:	Demonstrate an understanding of satellite and terrestrial principles	
Level: 4		Credits: 10

Purpose

This unit standard is intended for those who demonstrate an understanding of satellite and terrestrial principles. People credited with this unit standard are able to demonstrate an understanding of fundamentals of satellites, demonstrate an understanding of the space environment effect on satellites, demonstrate an understanding of satellite communications, demonstrate understanding of Very Small Aperture Terminal (VSAT) satellite, Describe and identify VSAT satellite system components.

This unit standard is intended for those who work in the telecommunication and wireless technology working environment.

Special Notes

1. Entry information:

Prerequisites:

- None

2. This unit standard is to be delivered and assessed in the context of information and communication technology.

3. Assessment evidence may be collected from a real or a simulated workplace in which telecommunication and wireless technology operations are carried out.

4. Tools and equipment may include but are not limited to computer, external devices, storage devices and other and basic computer applications.

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

6. Regulations and legislation relevant to this unit standard include the following:

- Labour Act 2007(Act No 11, 2007)
- Regulations relating to the health and Safety of employees at work under Schedule 1 (2) of the Labour Act No.11 of 2007 and all subsequent amendments.

Quality Assurance Requirements

This unit standard and others within this sub-field 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 on www.namqa.org and the Namibia Training Authority on www.nta.com.na

Elements and Performance Criteria

Element 1: Demonstrate an understanding of fundamentals of satellites

Range

Orbital parameters may include but not limited to Semi-major axis, eccentricity, inclination, right ascension of the ascending node, argument of perigee, epoch time, true anomaly, altitude, period and ground track.

Performance Criteria

- 1.1 Satellite are classified and described according to satellite technologies.
- 1.2 Orbital parameters are described according to satellite technologies.
- 1.3 Concept of satellite footprint is explained.
- 1.4 Physics of satellite orbits is explained.
- 1.5 Launching and final positioning of satellites is explained.

Element 2: Demonstrate an understanding of the space environment effect on satellites

Performance Criteria

- 2.1 Features of the space environment are listed with reference to satellite theory.
- 2.2 Effect of the earth's atmosphere on a satellite is described with reference to satellite theory.
- 2.3 Effect of sun emissions on a satellite is described with reference to satellite theory.

Element 3: Demonstrate an understanding of satellite communications

Range

Subsystems components on a communication satellite may include but not limited to station-keeping, power supply, telemetry, antenna and transponders.

Communication satellite may include but not limited to Fixed Service Satellites and Consumer Satellites.

Satellite frequency bands may include but not limited to C, Ku and Ka frequency bands, satellite frequency plan and polarization techniques

Performance Criteria

- 3.1 Features of satellite communications are explained.
- 3.2 Subsystems components of a communications satellite are outlined.
- 3.3 Communications satellites are classified and described.
- 3.4 Satellite frequency bands and utilization are explained.
- 3.5 Concept of satellite capacity is explained.

Element 4: Demonstrate an understanding of Very Small Aperture Terminal (VSAT) satellite

Performance Criteria

- 4.1 VSAT satellite fundamentals are explained.
- 4.2 VSAT satellite network operation is described.
- 4.3 VSAT satellite networks cost effectiveness are compared and explained according to terrestrial alternatives.

Element 5: Describe and identify VSAT satellite system components

Range

VSAT satellite components may include but not limited to antenna, Outdoor Unit or Feeder, Inter-facility Link Cable and Indoor Unit (Modem).

Outdoor Unit Inter-working and functionalities may include but not limited to Radio Frequency Up Converter, Solid State Power Amplifier, Low Noise Amplifier or Low Noise Blocker and Radio Frequency Down Converter.

Indoor Unit Inter-working and functionalities may include but not limited to modulator, demodulator and baseband Interface.

Earth Station system components may include but not limited to antenna, Inter-facility Link, RF Equipment, VSAT Interface Equipment and Network Management System.

Performance Criteria

- 5.1 Subcomponents, inter-working and functionalities of the outdoor unit are described.

5.2 Subcomponents, inter-working and functionalities of the indoor unit are described.

5.3 Earth station system components are outlined.

Registration Data

Subfield:	Information and Communication Technology
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