

Domain **TELECOMMUNICATION AND WIRELESS
TECHNOLOGY**

Title: **Demonstrate an understanding of basic
telecommunications**

Level: 4

Credits: 10

Purpose

This unit standard is intended for those who demonstrate an understanding of basic telecommunication. People credited with this unit standard are able to demonstrate an understanding of telecommunications infrastructure, demonstrate an understanding of analogue communication, demonstrate an understanding of analogue signal applications, demonstrate an understanding of digital communication, demonstrate an understanding of digital signal applications, illustrate network convergence, demonstrate an understanding of the use of broadband technologies and demonstrate an understanding of the uses of multimedia.

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

Special Notes

1. Entry information:

Prerequisite:

- 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. Glossary of terms:

- *Telecommunication*-is communication at a distance by technological means, particularly through electrical signals or electromagnetic waves.
- *Digital communication*- is information transmitted electronically and is encoded digitally. It is stored and processed by computers
- *Digital signal*- is the transmission of information that has been encoded digitally, and passed through digital devices such as computers.
- *Network convergence*- is the efficient coexistence of telephone, video and data communication within a single network. The use of multiple communication modes in a single network offers convenience and flexibility not possible with separate infrastructures. Network convergence is also called media convergence.

- *Broadband technology*- methods of delivering information across the internet at a higher rate by increasing bandwidth.
- *Multimedia*- is the integration of multiple forms of media. This includes text, graphics, audio, video, etc.
- *Radio frequency*- any frequency within the electromagnetic spectrum associated with radio wave propagation.

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)
- Workplace specific policies and regulations
- 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
- Telecommunications Act 2012
- Search and Surveillance Act 2012
- Electricity Safe) Regulations 2010 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 telecommunication infrastructure.

Range

Telecommunications technologies may include, but not limited to visual signals such as beacons, smoke signals, semaphore telegraphs, signal flags and optical heliographs; audio messages such as coded drumbeats, lung-blown horns and loud whistles; electrical and electromagnetic technologies include telegraph, telephone, and tele printer, networks, radio, microwave transmission, fibre optics, communications satellites and the internet.

Performance Criteria

- 1.1 Evolution of telecommunication technologies is outlined.
- 1.2 Major elements of the Public Service Telecommunication Network (PSTN) are outlined.
- 1.3 Local and remote testing practices are illustrated.

Element 2: Demonstrate an understanding of analogue communication

Performance Criteria

- 2.1 Types of analogue devices and signals are explained.
- 2.2 Analogue communication is explained.
- 2.3 Analogue modulation techniques are explained.

Element 3: Demonstrate an understanding of analogue signal applications

Performance Criteria

- 3.1 Analogue applications are outlined.
- 3.2 Analogue signal methods are illustrated.
- 3.3 Analogue to digital conversion is illustrated.

Element 4: Demonstrate an understanding of digital communication

Range

Communication protocols may include but are not limited to worldwide consortium (W3C), wireless access protocol (WAP), global system for mobile (GSM), 3rd generation protocols (3G); multimedia message service (MMS); general packet radio service (GPRS); blue tooth; broadband (ADSL), cable and voice/internet protocol.

Digital Communication methods may include but are not limited to email; instant message system (SMS); multi-media messaging system (MMS); internet; bulletin boards, discussion forums; weblogs (blogs); newsgroup; internet telephony; conferencing (video and audio); conferencing via virtual communities, e.g. MMPPRGs (Massive Multiplayer Persistent Online Role-Playing Games).

Performance Criteria

- 4.1 Radio frequency propagations are illustrated.
- 4.2 Types of telecommunication (communication) methods are outlined.
- 4.3 Digital communication systems are explained.
- 4.4 Modulation-demodulation methods are explained and illustrated.
- 4.5 Signal coding/decoding is demonstrated and applied.
- 4.6 Spread-spectrum system is explained and illustrated.
- 4.7 Bandwidth concept is presented.

Element 5: Demonstrate an understanding of digital signal applications

Range

Digital signal processing (DSP) applications include but are not limited to audio and speech signal processing, sonar and radar signal processing, sensor array processing, spectral estimation, statistical signal processing, digital image processing, signal processing for communications, control of systems, biomedical signal processing and seismic data processing.

Digital signal processes use video, voice, audio, temperature or position signals that have been digitized and mathematically manipulated.

Performance Criteria

- 5.1 Digital applications are outlined.
- 5.2 Methods used in computer vision are outlined and applied.
- 5.3 Speech technology is illustrated.
- 5.4 Basic principles of radar are outlined according to digital signal processing systems.

Element 6: Illustrate network convergence

Range

Convergence is about services and new ways of doing business and of interacting with society. It includes but is not limited to basic type of network convergence, the convergence of telecommunications of telecommunication services and market convergence.

Examples of new products and services include but are not limited to home-banking and home shopping over the internet, voice over internet protocol, email, texting, Web surfing, the use of wireless links, data service over digital broadcasting platforms, On-line services /gaming with television (Web-TV), streaming media, video conference applications, e-commerce, Webcasting of news, sports, concerts, and other audiovisual services.

Performance Criteria

- 6.1 Network convergence is outlined according to network standards and protocol.
- 6.2 Next generation Network is explained.
- 6.3 Network evolution from telecommunication network to IP network is discussed

Element 7: Demonstrate an understanding of the use of broadband technologies

Range

Broadband includes several high speed transmission technologies but are not limited to digital subscriber line (DSL), cable modem, fiber, wireless, satellite, broadband over power lines (BPL).

The types of DSL transmission technologies for household include asymmetrical digital subscriber line and symmetrical digital subscriber line, while high rate digital subscriber line and very high data rate digital subscriber line are normally for business environment.

FTTX systems may include but is not limited to Metro Jet, External VertiJet, Burry DAC system, Air Tract, Vertiqio, Façade, VertiDrop and VertiJet,

Performance Criteria

- 7.1 Broadband technologies are outlined.
- 7.2 Broadband service market is explained.
- 7.3 Broadband service suppliers are discussed according to converged end user service principles.
- 7.4 Broadband access network is illustrated in line with fixed and mobile complementary technologies.
- 7.5 Fixed line and wireless technologies are explained and illustrated.
- 7.6 Fibre to the premises (FTTX) implementation is explained according to TCP/IP/Ethernet principles.
- 7.7 Satellite services are explained.

Element 8: Demonstrate an understanding of the uses of multimedia

Performance Criteria

- 8.1 Multimedia in data networks are explained and applied according to task requirements.
- 8.2 Demand for multimedia communication is explained and applied.
- 8.3 Internet information distribution and exchange is illustrated according to user guidelines.
- 8.4 Multimedia streaming and conference is outlined.

Registration Data

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