REPUBLIC OF KENYA

NATIONAL OCCUPATIONAL STANDARD

FOR

NETWORK SYSTEM TECHNICIAN

KNQF LEVEL 5

CYCLE 3

PROGRAMME CODE: 0612454A

TVET CDACC

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NAIROBI

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FOREWORD

The provision of quality education and training is fundamental to the Government's overall strategy for social and economic development. Quality education and training contribute to the achievement of Kenya's development blueprint and sustainable development goals.

Reforms in the education sector are necessary to achieve Kenya Vision 2030 and meet the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution, and this resulted in the formulation of the Policy Framework for Reforming Education and Training in Kenya (Sessional Paper No. 14 of 2012). A key feature of this policy is the radical change in the design and delivery of TVET training. This policy document requires that training in TVET be competency-based, curriculum development be industry-led, certification be based on demonstration of competence, and the mode of delivery allow for multiple entry and exit in TVET programmes.

These reforms demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that this curriculum has been developed. For trainees to build their skills on foundational hands-on activities of the occupation, units of learning are grouped in modules. This has eliminated duplication of content and streamlined exemptions based on skills acquired as a trainee progresses in the up-skilling process, while at the same time allowing trainees to be employable in the shortest time possible through the acquisition of part qualifications.

It is my conviction that this occupational standards will play a great role in developing competent human resources for the ICT Sector's growth and development.

PRINCIPAL SECRETARY

STATE DEPARTMENT FOR TVET

MINISTRY OF EDUCATION

PREFACE

Kenya Vision 2030 aims to transform the country into a newly industrializing, "middle-income country providing a high-quality life to all its citizens by the year 2030". Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through life-long education and training. Technical, Vocational Education and Training (TVET) institutions have a responsibility of facilitating the process of inculcating knowledge, skills and attitudes necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace Competency Based Education and Training (CBET).

The Technical and Vocational Education and Training Act No. 29 of 2013 on Reforming Education and Training in Kenya, emphasizes the need to reform curriculum development, assessment and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labour force.

Industry experts in conjunction with experienced trainers from qualification awarding institutions developed these Occupational Standards.

These Occupational Standards are designed and organized with an outline of duties and tasks which are employable and the evidence guide for effective training. They also allow multiple entry and exit to the course.

I am grateful to the Council Members, Council Secretary, industrial experts in Information and Communication Technology sector, experienced trainers and all those who participated in the development of these Occupational Standards.

COUNCIL CHAIRPERSON

TVET CDACC

ACKNOWLEDGEMENT

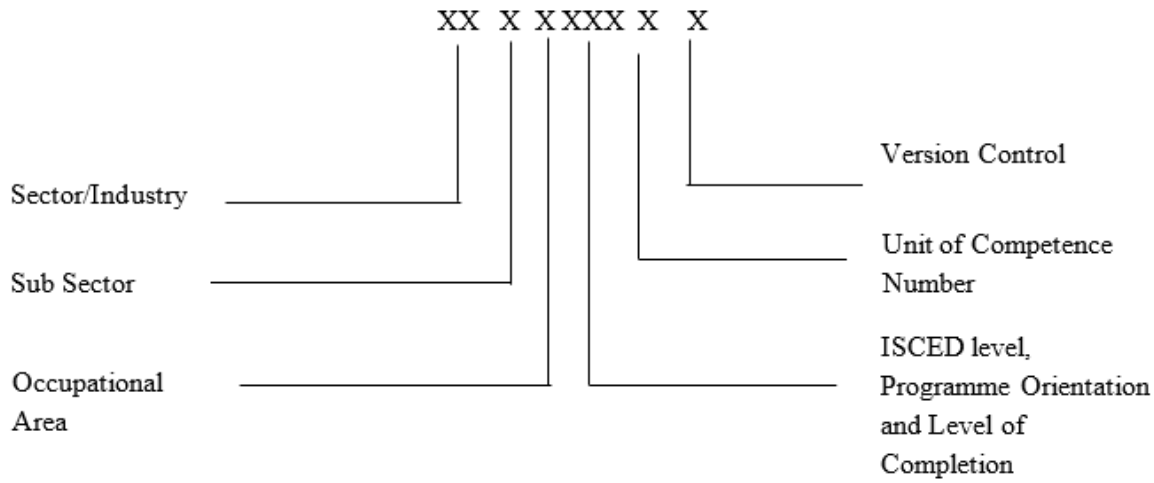
This Occupational Standards has been designed for competency-based training and has independent units of learning that allow the trainee flexibility in entry and exit. In developing the Occupational Standards, significant involvement and support were received from expert trainers, institutions and organizations.

I recognize with appreciation the role of the ICT National Sector Skills Committee (NSSC) in ensuring that competencies required by the industry are addressed in the Occupational Standards. I also thank all stakeholders in the ICT sector for their valuable input and everyone who participated in developing this Occupational Standards.

I am convinced that this Occupational Standards will go a long way in ensuring that individuals aspiring to work in the ICT sector acquire competencies to perform their work more efficiently and effectively.

CHAIRPERSON
ICT SECTOR SKILLS ADVISORY COMMITTEE

KEY TO UNIT CODE



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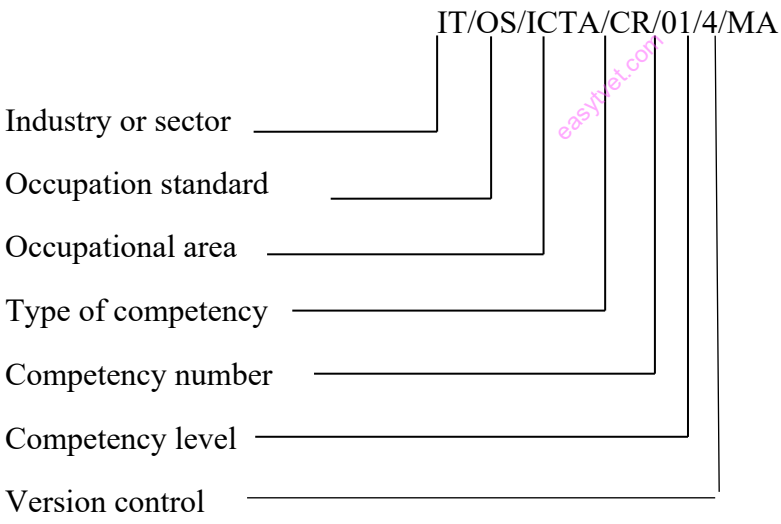

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OVERVIEW

Network System Technician Level 5 qualification consists of competencies that a person must achieve to enable him/her to be certified as a Network System Technician.

Network system Technician is a person who can demonstrate knowledge and competence in designing a computer network, installing a computer network, monitoring computer network security and performing computer repair and maintenance.

Therefore, Network system Technician is a well-trained person who can carry out these responsibilities. These responsibilities comprise the units of competency of a Network System Technician level 5 which include the following basic, common and core competencies:

SUMMARY OF UNITS OF COMPETENCY

ISCED UNIT CODE	TVET CDACC UNIT CODE	UNIT NAME
BASIC UNITS OF COMPETENCY		
0417 551 10A	IT/OS/NSA/BC/01/5/MA	Apply Work Ethics and Practices
COMMON UNITS OF COMPETENCY		
0611 441 01A	IT/OS/NSA/CC/01/5/MA	Apply Computer Operations
0714 451 03A	IT/OS/NSA/CC/02/5/MA	Perform Computer Repair and Maintenance
0714 441 09A	IT/OS/NSA/CC/03/5/MA	Apply Basic Electronics
CORE UNITS OF COMPETENCY		
0612 451 02A	IT/OS/NSA/CR/01/5/MA	Design Computer Network
0612 451 04A	IT/OS/NSA/CR/02/5/MA	Setup Computer Network
0612 451 05A	IT/OS/NSA/CR/03/5/MA	Install Computer Network Software
0612 451 06A	IT/OS/NSA/CR/04/5/MA	Configure Computer Network Security
0612 451 07A	IT/OS/NSA/CR/05/5/MA	Perform Computer Network Maintenance
0612 451 08A	IT/OS/NSA/CR/06/5/MA	Monitor Computer Network Security

APPLY WORK ETHICS AND PRACTICES

ISCED UNIT CODE: 0417 441 11A

TVET CDACC UNIT CODE: IT/OS/NSA/BC/01/5/MA

UNIT DESCRIPTION

This unit covers competencies required to effectively apply work ethics and practices. It involves the ability to: conduct self-management, promote ethical work practices and values, promote teamwork, manage workplace conflicts, maintain professional and personal development, apply problem-solving and promote customer care.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	**PERFORMANCE CRITERIA** These are assessable statements which specify the required level of performance for each of the elements. ***Bold and italicized terms are elaborated in Range***
1. Apply self-management skills	1.1 Personal vision, mission and goals are formulated based on potential and concerning organization objectives and strategic plan 1.2 Self-esteem and a positive self-image are developed and maintained based on value 1.3 Emotional intelligence and stress management are demonstrated as per workplace requirements. 1.4 Assertiveness is developed and maintained based on the requirements of the job. 1.5 Accountability and responsibility for one's actions are demonstrated based on workplace instructions. 1.6 Time management, attendance and punctuality are observed as per the organization's policy. 1.7 Personal goals are managed as per the organization's objective 1.8 Self-strengths and weaknesses are identified based on personal objectives 1.9 Motivation, initiative and proactivity are utilized as per the organization policy 1.10 Individual performance is evaluated and monitored according to the agreed targets.
2. Promote ethical work practices and values	2.1 Integrity is demonstrated as per acceptable norms 2.2 Codes of conduct is applied as per the workplace requirements 2.3 Policies and guidelines are observed as per the workplace requirements

	2.4 Professionalism is exercised in line with organizational policies
3. Promote Team work	3.1 ***Teams*** are formed to enhance productivity based on organization's objectives 3.2 Duties are assigned to teams under the organization policy. 3.3 Team activities are managed and coordinated as per set objectives. 3.4 Team performance is evaluated based on set targets as per workplace policy. 3.5 ***Conflicts*** are resolved between team members in line with organization policy. 3.6 Gender and diversity-related issues are identified and mainstreamed in accordance with workplace policy. 3.7 Healthy ***relationships*** are developed and maintained in line with the workplace. 3.8 Adaptability and flexibility are applied in dealing with team members as per workplace policies
4. Maintain professional and personal development	4.1 ***Personal growth and development*** needs are identified and assessed in line with the requirements of the job. *4.2* ***Training and career opportunities*** are identified and utilized based on job requirements. 4.3 ***Resources*** for training are mobilized and allocated based on organizations and individual skills needs. 4.4 Licenses and certifications relevant to the job and career are obtained and renewed as per policy. 4.5 Recognitions are sought as proof of career advancement in line with professional requirements. 4.6 Work priorities and personal commitments are balanced and managed based on the requirements of the job and personal objectives. 4.7 Dynamism and on-the-job learning are embraced in line with the organization's goals and objectives.
5. Apply Problem solving skills	5.1 ***Creative, innovative*** and practical solutions are developed based on the problem 5.2 Independence and initiative in identifying and solving problems are demonstrated based on the requirements of the job. 5.3 Team problems are solved as per the workplace guidelines 5.4 Problem-solving strategies are applied as per the workplace guidelines 5.5 Problems are analyzed and assumptions tested as per the context of data and circumstances
6. Promote Customer Care	6.1 Customers' needs are identified based on their characteristics 6.2 Customer ***feedback*** is allowed and facilitated in line with organization policies.

	6.3 Customer concerns and complaints are analyzed and resolved in line with the set organizational culture. 6.4 Proactive customer outreach programs are implemented as per organizational policies 6.5 Customer retention strategies are developed and implemented in line with the organizational policy

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	**Range**
1. Feedback may include but not limited to:	• Verbal • Written • Informal • Formal
2. Conflicts include but are not limited to:	• Interpersonal Conflict. • Intrapersonal Conflict. • Intergroup Conflict. • Intragroup Conflict.
3. Relationships may include but not limited to:	• Man/Woman • Trainer/trainee • Employee/employer • Client/service provider • Husband/wife • Boy/girl • Parent/child • Sibling relationships
4. Team may include but not limited to:	• Small work group • Staff in a section/department • Inter-agency group • Virtual teams
5. Personal growth may include but not limited to:	• Growth in the job • Career mobility • Gains and exposure the job gives • Net workings • Benefits that accrue to the individual as a result of noteworthy performance
6. Personal objectives may include but not limited to:	• Long term • Short term • Broad • Specific

7. Trainings and career opportunities may include but not limited to	• Participation in training programs • Serving as Resource Persons in conferences and workshops • Capacity building
8. Resource may include may but not limited to:	• Human • Financial • Technology
9. Creative and innovative may include but not limited to:	• New ideas • Original ideas • Different ideas • Methods/procedures • Processes • New tools
10. Emerging issues may include but not limited to:	• Artificial Intelligence • Data confidentiality • National cohesion • Open offices

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Active listening
- Critical thinking
- Organizational
- Negotiation
- Monitoring
- Evaluation
- Problem solving
- Decision Making
- Leadership
- Creative/innovative thinking
- Adaptability
- Conflict management
- Emotional intelligence
- Teamwork

Required Knowledge

The individual needs to demonstrate knowledge of:

- Work values and ethics
- Company policies and procedures
- Company operations, procedures and standards
- Flexibility and adaptability
- Concept of time and leisure time
- Decision making
- Work planning
- Organizing work
- Monitoring and evaluation
- Record keeping
- Gender and diversity mainstreaming
- Drug and substance abuse

- Professional growth and development
- creativity
- Innovation
- problem solving
- customer care
- mentoring and coaching.
- Emerging issues

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical aspects of Competency	Assessment require evidence that the candidate: 1.1 Applied self-management skills as per organizational procedures. 1.2 Promoted ethical practices and values as per organizational procedures. 1.3 Promoted Teamwork as per workplace assignments. 1.4 Maintained professional and personal development as per organizational procedures. 1.5 Applied Problem-solving skills based on work requirements. 1.6 Identified customer needs based on their characteristics. 1.7 Gave back Customer feedback in line with organization policies.
2. Resource Implications	The following resources should be provided: 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place.

	2.3 Resources relevant to the proposed activity or tasks.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview 3.6 Third party report
4. Context of Assessment	This Competency may be assessed in a workplace or a simulated workplace
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

APPLY COMPUTER OPERATIONS

ISCED UNIT CODE: 0611 441 01A

TVET CDACC UNIT CODE: IT/OS/NSA/CC/01/5/MA

UNIT DESCRIPTION

This unit covers the competencies required to apply computer operations. It involves processing computerized word documents, manipulating computerized spread sheets, maintaining computerized databases, prepare PowerPoint presentation, manipulating graphic application and performing online collaboration.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function	**PERFORMANCE CRITERIA** These are assessable statements which specify the required level of performance for each of the elements. ***Bold and italicized terms are elaborated in the Range***
1. Process computerized word document	1.1 Ergonomics risk factors observed as per work place procedures 1.2 Word document is created as per work requirements 1.3 Tables are created and manipulated as per work requirements 1.4 Mail merging is performed as per work requirements 1.5 ***Word processing Objects*** are inserted as per user requirements 1.6 List of figures and table of content are generated as per user requirements

2. Manipulate computerized spread sheet	2.1 Spreadsheet workbook is created as per work requirements 2.2 Cell referencing is performed as per task requirements 2.3 Formula and ***functions*** are applied as per work requirements 2.4 Charts are generated as per work requirements
3. Maintain computerised database	3.1 Computerised database user requirements are collected as per work requirements. 3.2 Computerised database schema are designed as per task requirements. 3.3 Creation of Computerized database objects as per task requirements. 3.4 Data manipulation is performed as per task requirements.
4. Prepare Power point presentation	4.1 Power-point slides are created as per work requirements 4.2 Presentation views are exhibited as per work requirements 4.3 Animations and transitions are performed as per work requirements 4.4 Slideshow is Presented as per work requirements
5. Manipulate graphic application	5.1 Identifying graphic design requirements

6. Perform document production	5.2 Graphic design created as per task requirements 5.3 Graphic design published as per the task requirements 6.1 Document is printed as per user specifications 6.2 Documents are scanned as per user specifications 6.3 Documents are duplicated as per user specifications
7. Perform Online Collaboration	7.1 Identification of Online collaboration tools as per the task requirements 7.2 Prepare online collaboration as per the task requirements. **7.3 Apply** online collaborative tools as per the task requirements. 7.4 Demonstrating Mobile collaborations as per task requirements

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	**Range**
1. Word Processing Objects may include but are not limited to:	• Picture • Shapes • Table • Charts
2. Functions may include but are not limited to:	• Sum • Count • Average • Max • Min • Rank

3. Presentation views may include but are not limited to:	These are the methods used to show the presentation to the audience. • Outline • Normal • Slide sorter • Notes page • Reading view
4. Online document processing may include but is not limited to:	Is the use of web-based applications or platforms to create, edit, store, share and collaborate on various types of documents. • Online data entry • File conversion • Google documents • E- tasks
5. Online collaboration: This may include but not limited to:	These are the online web-based tools and services performed • Video conferencing • Chatting • Cloud computing • Social media • Online calendar • Mailing

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Communication skills
- Evaluation skills
- Problem solving skills
- Time management

Required Knowledge

The individual needs to demonstrate knowledge of:

- Social media
- Online storage
- Online meetings
- Online data entry
- E-tasks

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Created a word document 1.2 Inserted objects 1.3 Performed mail merging 1.4 Created a table of contents 1.5 Created a workbook 1.6 Performed cell referencing 1.7 Created formula and functions 1.8 Generated charts 1.9 Performed Data manipulation 1.10 Made a presentation 1.11 Created animations and transitions 1.12 Printed a document 1.13 Scanned a document 1.14 Duplicated a document 1.15 Transferred a file online 1.16 Processed a document online 1.17 Performed online collaboration
Resource Implications	The following resources should be provided: 2.1 Access to relevant workplace where assessment can take place

	2.2 Appropriately simulated environment where assessment can take place
Methods of Assessment	Competency may be assessed through: 3.1 Demonstration 3.2 Practical assignment 3.3 Oral Questioning 3.4 Written Test
Context of Assessment	Competency may be assessed: 4.1 On-the-job 4.2 In a simulated work environment
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

PERFORM COMPUTER REPAIR AND MAINTENANCE

ISCED UNIT CODE: 0714 451 03A

TVET CDACC UNIT CODE: IT/OS/NSA/CC/02/5/MA

UNIT DESCRIPTION:

This unit covers the competencies required for performing computer repair and maintenance. It involves the ability to: perform computer troubleshooting, repair faulty components, Test computer component functionality and perform computer maintenance.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace functions	**PERFORMANCE CRITERIA** These are assessable statements which specify the required level of performance for each of the elements. ***(Bold and italicized terms are elaborated in the range)***
1. Perform computer troubleshooting	1.1 User data is assessed as per workplace procedures. 1.2 Computer problems are identified as per the assessed user data. 1.3 Solution to the problem is determined as per workplace procedure.
2. Repair faulty components.	2.1 ***Computer components*** for replacement are selected as per the workplace procedure. 2.2 ***Tools*** **for repairing or replacing** are assembled as per the workplace procedure. 2.3 ***Safety procedures*** are observed as per workplace procedures. 2.4 Faulty computer components are repaired or replaced as per the manufacturer's manual. 2.5 Obsolete or faulty computer components are ***disposed*** as per workplace procedures.

3. Test computer component functionality	3.1 Computer is switched on for POST test as per workplace procedure.Computer component test is performed as per workplace procedure. 3.3 Computer component's functionality report is generated as per workplace procedure.
4 Perform computer maintenance	4.1 Computer maintenance is scheduled as per the workplace procedure. 4.2 Computer maintenance is performed as per the workplace procedure. 4.3 Computer maintenance report is generated as per workplace procedure.

RANGE

Variable	**Range**
1. Computer components may include but are not limited to:	• Input components. • Output components. • Storage components • Processing components • Communication components
2. Safety procedures may include but are not limited to:	Personal Protective Equipment: • Overall/apron/dust coat • Antiglare screens • Dust mask • Gloves • Safety boots • Antistatic equipment • Antistatic wrist strap • Antistatic mat • Antistatic gloves • Ergonomics

	• First AID kit
3. Tools for repairing or replacing may include but are not limited to:	• Straight-head screwdriver, large and small • Phillips-head screwdriver, large and small • Tweezers or part retriever • Needle-nosed pliers • Wire cutters • Chip extractor • Hex wrench set • Torx screwdriver
4. Disposed may include but are not limited to:	• E- waste • Pollution • Hazards • Disposal methods

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

The individual needs to demonstrate knowledge of:

- Troubleshooting techniques
- Procedures and techniques for reassembling
- Component testing techniques
- Computer systems and their components
- The manufacturer's warranty requirements relating to activities for the computer and related components.
- Types of Computer/component testing
- Types of Maintenance techniques

Required skills

The individual needs to demonstrate the following skills:

- Communications skills
- Proficient in ICT
- Time management
- Faults troubleshooting
- Problem solving
- Planning
- First aid
- Critical thinking

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and understanding and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified computer problems as per the assessed user data. 1.2 Determined solution to the problem as per workplace procedure. 1.3 Selected computer components for replacement as per the workplace procedure. 1.4 Assembled tools for repairing or replacing as per the workplace procedure. 1.5 Repaired or replaced faulty computer components as per the manufacturer's manual. 1.6 Performed computer component test as per workplace procedure. 1.7 Performed computer maintenance as per the workplace procedure.
2. Resource implications	The following resources should be provided: 2.1 Appropriately simulated environment where assessment can take place.

	2.2 Access to relevant work environment. 2.3 Resources relevant to the proposed activities or tasks.
3. Methods of assessment	Competency may be assessed through: 3.1 Practical 3.2 Projects 3.3 Third Party Reports 3.4 Portfolio of evidence 3.5 Written tests
4. Context of Assessment	Competency may be assessed in a workplace or in a simulated workplace
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace job role is recommended.

APPLY BASIC ELECTRONICS

ISCED UNIT CODE: 0714 441 10A
TVET CDACC UNIT CODE: IT/OS/NSA/CC/03/5/MA

UNIT DESCRIPTION

This unit specifies the competencies required to apply basic electronic. It involves identifying electric circuits, identifying electronic components, understanding semi-conductor theory, identifying memories, applying number systems, applying logic gates and performing Boolean algebra operations

ELEMENTS AND PERFORMANCE CRETIRIA

ELEMENT *These describe the key outcomes which make up workplace functions*	**PERFORMANCE CRITERIA** ***(Bold and italicized terms are elaborated in the Range)***
1. Identify electrical circuits	1.1 Electrical circuit are identified as per electrical engineering principles 1.2 ***Electrical quantities and their S.I units*** are identified as per electrical engineering standards 1.3 ***Types of electrical circuits*** are identified as per electrical engineering standards
2. Identify electronic components	2.1 Electronic components are Identified as per electrical engineering standard 2.2 Characteristic of electronic components are identified as per their operations 2.3 Application of electronic components are Identified as per workplace functions 2.4 Characteristics of integrated circuit are identified as per the standard mode of operations.

3. Apply Semi-conductor theory	3.1 Explanation of semiconductor theory is done as per the electronics principles. 3.2 Structure of matter is described as per electronics principles 3.3 Electrons in conductors and semiconductors are explained as per electronics principles 3.4 Types of semiconductor materials are identified as per electronics principles 3.5 P-type and N-type materials are explained as per electronics principles 3.6 Description of P-N junction diodes operations is done as per their operations 3.7 Types and operations of transistors are identified as per electronics principles 3.8 Semiconductor theory is applied in electrical circuits as per electronics principles
4. Classify computer memory	4.1 ***Classification of computer memories*** are identified as per their characteristics 4.2 Memory hierarchy is identified as per memory speed 4.3 ***Levels of memory storage*** are identified as per technology used. 4.4 Classification of memories is done as per the technology used
5. Apply logic gates	5.1 Logic gates are identified as per the Digital Electronics principles 5.2 Logic circuits are developed as per the standard procedures 5.3 Logic circuits are simplified as per the standard procedures 5.4 Apply logic gates in electronic circuits as per digital Electronics principles

6. Perform Boolean algebra operations	6.1 Key concepts in Boolean algebra are explained as per the digital electronics principles 6.2 Boolean Expressions are demonstrated as per the SOPs 6.3 Basic Boolean operations are performed as per the SOPs 6.4 Methods of simplifying Boolean expressions are illustrated as per the SOPs 6.5 Boolean Laws and Theorems are illustrated as per the SOPs 6.6 Simplification rules for Boolean expressions are illustrated as per the SOPs

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	**Range** ***May include but is not limited to:***
1. Electrical quantities and their units	• E.M.F in volts • Power in watts • Energy in joules • Resistance in ohms • Current in amperes
2. Types of electrical circuits	• AC – Alternating Current • DC – Direct Current

3. Types and operations of transistors	• Types
	  ◦ PNP
	  ◦ NPN
	• Operations
	  ◦ Forward biasing
	  ◦ Reverse Biasing

4. Types of memories	• Semi-conductor • Magnetic

	• Optical
5. Classification of memories	• RAM • ROM
6. Levels of memory storage	• Internal • Main • Online • Offline bulk

REQUIRED KNOWLEDGE AND UNDERSTANDING

The individual needs to apply knowledge and understanding of:

- Electrical Components
- Electrical Quantities and units of measurement
- Electrical circuits
- Semiconductor theory
- Types of Computer memories
- Boolean algebra
- Logic gates

FOUNDATION SKILLS

The individual needs to apply the following foundation skills:

- Communications (verbal and written);
- Proficient in ICT
- Time management
- Problem solving
- Decision making
- First aid

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and understanding and range.

1. Critical Aspects of Competency	***Assessment requires evidence that the candidate:*** 1.1 Identified electrical quantities and their S.I units as per electrical engineering standards

	1.2 Identified types of electrical circuits as per electrical engineering standards 1.3 Identified electronic components as per electrical engineering standard 1.4 Memory storage as per technology used 1.5 Identified application of electronic components as per work place functions 1.6 Identified type and operations of transistors as per electronics principles 1.7 Identified logic gates as per the Digital Electronics principles 1.8 Developed logic circuits as per the standard procedures 1.9 Simplified logic circuits as per the standard procedures 1.10 Performed basic Boolean operations as per work procedures
2. Resource Implications	The following resources should be provided: 2.1 Appropriately simulated environment where assessment can take place 2.2 Access to relevant work environment 2.3 Resources relevant to the proposed activities or tasks
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Practical 3.2 Projects 3.3 Third party reports 3.4 Portfolio of evidence evaluation 3.5 Written tests
4. Context of Assessment	This Competency may be assessed individually in a workplace or simulated workplace
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

DESIGN COMPUTER NETWORK

ISCED UNIT CODE: 0612 451 02A

TVET CDACC UNIT CODE: IT/OS/NSA/CR/01/5/MA

UNIT DESCRIPTION

This unit covers the competencies required to Design a computer network. It involves the following: Perform computer network site survey, Design Computer network topology and Document Computer network design.

Elements *These describe the key outcomes which make up workplace functions*	**Performance Criteria** *These are assessable statements which specify the required level of performance for each of the elements* ***(Bold and italicized terms are elaborated in the range)***
1. Perform computer network site survey.	1.1. Current infrastructure is evaluated as per work procedure 1.2 ***Network needs*** are identified as per the organization's policy. 1.3 Fundamental ***Network Design goals*** are determined as per work procedure. 1.4 Computer network site layout is designed as per industry standards. 1.5 ***Transmission media*** is identified as per IEEE 802.11, 802.3 1.6 ***E-waste*** is managed as per work standards. 1.7 ***Green energy sources*** are identified as per work procedure
2 Design Computer network topology.	2.1 Network Floor plan is designed as per work procedure. 2.2 Computer ***network active components*** are determined as per work procedure. 2.3 Network device locations are determined as per IEEE 802.11, 802.3 2.4 ***Computer network topology*** is designed as per work procedure.

3 Document Computer network design.	3.1 Computer ***Network report*** is created as per organizational standards. 3.2 Network topology diagram is generated as per work procedure. 3.3 Device names, roles and IP addresses are documented as per work procedure.

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

VARIABLE	RANGE
1. Network needs may include but not limited to;	● Communication ● Resource sharing ● Data sharing and collaboration ● Internet access ● Data back-up and recovery ● Security ● Fault tolerance and Redundancy
2. Network design goals may include but not limited to;	● Scalability ● Reliability ● Performance ● Security ● Flexibility ● QOS ● Accessibility
3. Transmission media may include but not limited to;	● Coaxial cable ● Fibre Optic ● Twisted pair ● Satellite ● Microwave
4. E-waste may include but not limited to;	● Obsolete servers ● Obsolete switches and routers ● Networking cables and connectors ● Obsolete computers and computer accessories
5. Network active components may include but not limited to;	● Router ● Switch ● Firewall

6. Green energy sources may include but not limited to;	• Renewable energy sources • Energy efficient hardware • Virtualization and Consolidation • Energy aware routing • Energy monitoring and reporting
7. Computer network topology may include but not limited to;	• Star • Ring • Bus • Mesh • Hybrid
8. Network report may include but not limited to;	• Network performance report • Security report • Inventory report • Usage report • Incident report

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

- Network architecture
- Network components and devices
- Safety awareness
- Project management
- Environmental conservation
- Workplace safety and health

Required skills

- Computer Literacy
- Critical thinking
- Communication skills
- Problem-solving skills
- Analytical skills
- Creativity and innovation

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Performed Computer Network Site Survey as per work procedure 1.2 Designed computer network topology as per work procedure 1.3 Documented Computer network design as per work procedure
2. Resource implications	The following resources should be provided: 2.1 Appropriately simulated environment where assessment can take place 2.2 Access to relevant work environment 2.3 Resources relevant to the proposed activities or tasks; including computers, media, routers, switches, ports etc.
3. Methods of assessment	Competency in this unit may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Portfolio of evidence 3.4 Interviews 3.5 Third party report 3.6 Practical assessment 3.7 Written tests
4. Context of assessment	This Competency may be assessed: 4.1 in a workplace 4.2 In a simulated workplace
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

SETUP COMPUTER NETWORK

ISCED UNIT CODE: 0612 451 04A

TVET CDACC UNIT CODE: IT/OS/NSA/CR/02/5/MA

UNIT DESCRIPTION:

This unit covers the competencies required to Setup a computer network. It involves following: Assemble computer network components, Test Computer network connectivity, Document Computer network configurations and Conduct Computer Network user training.

Elements These describe the key outcomes which make up workplace functions	Performance Criteria These are assessable statements which specify the required level of performance for each of the elements ***(Bold and italicized terms are elaborated in the range)***
1. Setup computer network.	1.1. ***Network components*** are assembled as per IEEE 802.3 and IEEE 802.11 networking standards. 1.2. ***Network components*** are connected according to IEEE 802.3 and IEEE 802.11 networking standards 1.3. ***Network components*** and network devices are configured as per IEEE networking standards
2. Test Computer network connectivity	2.1. ***Network component*** performance is tested as per industry standards. 2.2. Network performance is tested as per work procedure. 2.3. ***Network testing*** report is generated as per work procedure 2.4 ***Transmission Media*** are tested as per work procedure
3. Document Computer network configurations	3.1. ***Network component*** configurations are documented as per work procedure. 3.2. Network data points are labeled as per work procedure 3.3. Network topology design is labeled as per work procedure
4. Conduct Computer Network user training	4.1 Basic network navigation is conducted as per work procedure 4.2 Common issues are Troubleshoot as per work procedure 4.3 ***Data backup and recovery*** is performed as per work procedure

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Transmission media may include but not limited to:	• Fiber • UTP • Coaxial • Radio • STP
2. Network components may include but not limited to:	• Switches • Routers • Radio • Servers • Host
3. Network testing may include but not limited to;	• Performance testing • Functionality testing • Security testing • Resilience and Recovery Testing • connectivity testing • Media testing • Bandwidth testing
4. Data backup and recovery may include but not limited to;	• Data identification and classification • Backup strategy design • Selection of backup solutions • Implementation of backup procedures • Regular backup execution • Monitoring and verification

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.:

Required knowledge

- Network architecture
- Network components and devices
- Network types
- Safety Awareness
- Environmental conservation
- Workplace safety and health

Required skills

- Computer Literacy
- Critical thinking
- Communication skills
- Computational mathematics skills
- Problem-solving skills
- Analytical skills
- Creativity and innovation
- Network testing techniques
- Network security configuration
- Network configuration techniques

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Set up a computer network as per work procedure 1.2 Tested network connectivity as per work procedure 1.3 Documented network configuration as per work procedure 1.4 Conducted network user training as per work procedure
2. Resource implications	The following resources should be provided: 2.1 Appropriately simulated environment where assessment can take place 2.2 Access to relevant work environment 2.3 Resources relevant to the proposed activities or tasks; including computers, media, routers, switches, ports etc
	Competency in this unit may be assessed through: 3.1 Observation

3. Methods of assessment	3.2 Oral questioning 3.3 Portfolio of evidence 3.4 Interviews 3.5 Third party report 3.6 Practical assessment 3.7 Written tests
4. Context of assessment	4.1 This Competency may be assessed in a workplace or a simulated workplace
5. Guidance information for assessment	5.1 Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

INSTALL COMPUTER NETWORK SOFTWARE

ISCED UNIT CODE: 0612 451 05A

TVET CDACC UNIT CODE: IT/OS/NSA/CR/03/5/MA

UNIT DESCRIPTION

This unit covers the competencies required to Install Computer Network Software. It involves the following: Conduct Network Software Simulation, Perform Computer Network software installation, Test Computer Network Software and Monitor computer network software performance.

Elements *These describe the key outcomes which make up workplace functions*	Performance Criteria These are assessable statements *which specify the required level of performance for each of the elements* ***(Bold and italicized terms are elaborated in the range)***
1. Conduct Network Software Simulation	1.1.***Computer network software*** requirements are determined as per work procedure. 1.2 ***Computer network simulation Software*** is installed and configured as per software manual. 1.3 ***Network Simulation activities*** are created as per work procedure.
2. Perform Computer Network software installation	2.1 ***Network operating system*** is installed as per work procedure. 2.2 ***Network monitoring and management tools*** are installed as per work procedure. 2.3 Network monitoring tools are configured as per work procedure.
3 Test Computer Network Software	3.1 ***Software testing*** is performed as per user requirements 3.2 Corrective measures are performed as per user requirements 3.3 ***Computer software*** functionality test report is generated as per work procedure
4. Conduct Computer Network software user training	*4.1 User skill gap is determined as per work procedure* *4.2 User training manuals are prepared as per software manual.* *4.3 User training is conducted as per user training manual* *4.4 Training report is generated as per work procedure*

5.Monitor computer network software performance	5.1 ***Real-time monitoring*** is performed as per work procedure 5.2 ***Bandwidth and Throughput analysis is conducted as per work procedures*** 5.3 ***Network Alerts and notifications are monitored as per work procedures***

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

1. Computer Network Software may include but not limited to;	● Operating systems ● Network protocols and services ● Network management software ● Remote desktop software ● Network backup and recovery software ● VoIP software
2. Computer network simulation Software may include but not limited to;	● Cisco Packet Tracer ● Graphical Network Simulator ● Wireshark
3. Network Simulation activities may include but not limited to;	● Packet tracer tracer exercises ● Wireshark analysis ● Cloud based simulations
4. Network Operating system may include but not limited to;	● Windows server ● Linux-based NOS ● Cisco IOS
5. Network monitoring and management tools may include but not limited to;	● Wireshark ● Nagios ● Zabbix ● Cisco Prime Infrastructure
6. Software testing may include but not limited to;	● Functional testing ● Performance testing ● Security testing ● Compatibility testing ● Scalability testing ● Usability testing
7. Real-time monitoring may include but not limited to;	● SNMP ● Packet sniffers ● Performance monitoring tools ● Flow-based analytics
8. Network Alerts and Notification may include but not limited to;	● Security alerts ● Performance alerts ● Hardware alerts ● Configuration alerts

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency:

Required knowledge

- Network components and devices
- Network security measures
- Network protocols
- Understanding Operating System
- Environmental conservation
- Workplace safety and health

Required skills

- Computer Literacy
- Critical thinking
- Problem-solving skills
- Analytical skills
- Technical proficiency
- Storage solutions
- Operating systems proficiency

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Conducted Network Software simulation as per work procedure 1.2 Performed Computer Network software installation as per work procedure 1.3 Tested Computer Network Software as per work procedure 1.4 Monitored network software performance as per work procedure
2. Resource implications	The following resources should be provided: 2.1 Appropriately simulated environment where assessment can take place 2.2 Access to relevant work environment 2.3 Resources relevant to the proposed activities or tasks; including computers, media, routers, switches, ports etc.

3. Methods of assessment	Competency in this unit may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Portfolio of evidence 3.4 Interviews 3.5 Third party report 3.6 Practical assessment 3.7 Written tests
4. Context of assessment	This Competency may be assessed: 4.1 On the job 4.2 In a simulated workplace
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

CONFIGURE COMPUTER NETWORK SECURITY

ISCED UNIT CODE: 0612 451 06A

TVET CDACC UNIT CODE: IT/OS/NSA/CR/04/5/MA

UNIT DESCRIPTION

This unit covers the competencies required to Configure Computer network security. It involves the following: Conduct computer network risk assessment, Perform computer network segmentation, Configure network firewall and Conduct Computer Network security user training

Elements These describe the key outcomes which make up workplace functions	**Performance Criteria** These are assessable statements which specify the required level of performance for each of the elements ***(Bold and italicized terms are elaborated in the range)***
1. Conduct computer network risk assessment	1.1 Inventory of network components is taken as per work procedure 1.2 ***Security Threats & Vulnerabilities*** are identified and prioritized as per work procedure. 1.3 ***Security Controls*** are developed and implemented as per work procedure. 1.4 Risk Assessment Report is documented as per work procedure.
2. Perform computer network segmentation	2.1 IP addressing scheme is performed as per IEEE 802.3 and IEEE 802.11. 2.2 Network segmentation is determined as per the network design 2.3 Network privileges are allocated according to the network configuration.
3. Configure computer network firewall	3.1 ***Firewall*** is secured as per work procedure 3.2 ***Firewall*** zones and an IP address structure are established as per work procedure 3.3 Access control lists are configured as per work procedure 3.4 Login and firewall services are configured as per work procedure 3.5 ***Firewall*** configuration is tested as per work policy 3.6 ***Firewall*** is periodically Managed as per Work procedure

4. Conduct Computer Network security user training	4.1 Security awareness training is conducted as per work procedure 4.2. Network security practices are implemented as per work procedure 4.3. Incident response training is conducted as per work procedure 4.4 Regular updates and refresher training is performed as per work procedure 4.5. Compliance training is conducted as per work procedure 4.6. Testing and simulation is performed as per work procedure.

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	**Range**
1. Security threats and vulnerabilities may include but not limited to:	• Malware • Phishing • Denial of service • Man in the middle attack
2. Security Controls may include but not limited to:	• Preventive • Detective controls • Corrective controls • Deterrent controls • Compensating controls
3. Firewall may include but not limited to:	• Hardware firewall • Software firewall • Cloud firewall • Open source firewall

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.:

Required knowledge

- Network architecture
- Network components and devices
- Network security measures

- Network monitoring procedures
- Network testing procedures
- Understanding operating system
- Safety awareness
- Environmental conservation
- Workplace safety and health

Required skills

- Computer Literacy
- Critical thinking
- Communication skills
- Problem-solving skills
- Analytical skills
- Creativity and innovation
- Network testing techniques
- Network security configuration
- Network configuration techniques
- Network Monitoring
- Technical proficiency
- Project management
- Storage solutions
- Operating systems proficiency

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Conducted computer network risk assessment as per work procedure 1.2 Performed computer network segmentation as per work procedure 1.3 Configured network firewall as per work procedure 1.4 Conducted computer network security user training as per work procedure
2. Resource implications	The following resources should be provided: 2.1 Appropriately simulated environment where assessment can take place

	2.2 Access to relevant work environment 2.3 Resources relevant to the proposed activities or tasks; including computers, media, routers, switches, ports etc
3. Methods of assessment	Competency in this unit may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Portfolio of evidence 3.4 Interviews 3.5 Third party report 3.6 Practical assessment 3.7 Written tests
4. Context of assessment	This Competency may be assessed: 4.1 On the Job 4.2 In a simulated workplace
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

PERFORM COMPUTER NETWORK MAINTENANCE

ISCED UNIT CODE: 0612 451 08A

TVET CDACC UNIT CODE: IT/OS/NSA/CR/05/5/MA

UNIT DESCRIPTION:

This unit covers the competencies required to Perform Computer Network maintenance. It involves the following: Analyze Computer Network Performance, Troubleshoot Computer Network Components and Perform Computer Network Component Repair.

Elements *These describe the key outcomes which make up workplace functions*	**Performance Criteria** *These are assessable statements which specify the required level of performance for each of the elements* ***(Bold and italicized terms are elaborated in the range)***
1. Analyze Computer Network Performance	1.1 Network ***Traffic analysis*** is performed as per work procedure. 1.2 Network ***Bandwidth utilization*** is monitored as per work procedure. 1.3 Computer network ***Latency measurement*** is conducted as per work procedure. 1.4 Network ***Device performance monitoring*** is performed as per work procedure.
2 Troubleshoot Computer Network Components	2.1 ***Basic electronic skills*** are applied as per industry standards 2.2 Network components and connections are tested as per industry standards 2.3 Network configuration is verified as per work procedure 2.4 Logs and error messages are reviewed as per work procedure 2.5 Report is generated as per the work procedure

3 Perform Computer Network Component Repair	3.1 Faulty network component is Isolated as per work procedures 3.2 Problem-solving procedure is established as per work procedures 3.3 Maintenance tools are selected 3.4 Faults Identified are solved as per work procedure. 3.5 Network component repair procedure is documented as per work procedure.
4 Maintain computer network	4.1 Hardware maintenance and regular software updates are performed 4.2 Network monitoring and Performance optimization is implemented as per work procedure 4.3 Backup and disaster recovery is performed as per work requirement 4.4 Documentation and inventory are maintained 4.5 Compliance and regulatory updates are conducted as per work procedure

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

1. Traffic analysis may include but not limited to:	• Bandwidth monitoring • Packet inspection • Performance optimization • Forensic analysis • Real-time monitoring and alerts
2. Bandwidth utilization may include but not limited to:	• Web browsing • File downloads
3. Latency measurement may include but not limited to:	• Ping • Traceroute • Wireshark • Network monitoring tools
4. Device performance monitoring may include but not limited to:	• Metrics tracking • Alerting • Real-time monitoring • Security monitoring
5. Basic electronic Skills may include but not limited to:	• Cable termination and crimping • Signal transmission • Power Over Ethernet (POE)

	• Basic implementation of Networking protocols

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.:

Required knowledge

- Network security measures
- Network testing procedures
- Safety awareness
- Environmental conservation
- Workplace safety and health
- Basics electronics

Required skills

- Critical thinking
- Communication skills
- Problem-solving skills
- Creativity and innovation
- Network security configuration
- Network configuration techniques
- Network Monitoring
- Technical proficiency
- Scripting and automation
- Operating systems proficiency
- Server Administration
- Basic programming

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Troubleshoot computer network components as per work procedure 1.2 Performed network component repair as per work procedure 1.3 Maintained a computer network as per work procedure
	The following resources should be provided:

2. Resource implications	2.1 Appropriately simulated environment where assessment can take place 2.2 Access to relevant work environment 2.3 Resources relevant to the proposed activities or tasks; including computers, media, routers, switches, ports etc.
3. Methods of assessment	Competency in this unit may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Portfolio of evidence 3.4 Interviews 3.5 Third party report 3.6 Practical assessment 3.7 Written tests
4. Context of assessment	4.1 This Competency may be assessed in a workplace or a simulated workplace.
5. Guidance information for assessment	5.1 Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

MONITOR COMPUTER NETWORK SECURITY

ISCED UNIT CODE: 0612 451 09A

TVET CDACC UNIT CODE: IT/OS/NSA/CR/06/5/MA

UNIT DESCRIPTION

This unit covers the competencies required to Monitor Computer network security. It involves the following: Conduct computer network security assessment, Monitor Computer Network Firewall activities and perform fundamental Computer Network segmentation

Elements *These describe the key outcomes which make up workplace functions*	**Performance Criteria** These are assessable statements *which specify the required level of performance for each of the elements* ***(Bold and italicized terms are elaborated in the range)***
1. Conduct computer network security assessment	1.1 ***Network Security Threats & Vulnerabilities*** are identified and prioritized as per work procedure. 1.2 ***Network Security Controls*** are implemented as per work procedure. 1.3 Network Risk Assessment Report is documented as per work procedure
2 Monitor Computer Network Firewall activities	2.1 ***Firewall activities*** are monitored as per work procedures 2.2 Firewall updates are performed as per work procedures 2.3 Computer network traffic is monitored as per work procedure
3. Perform fundamental Computer Network segmentation	3.1 ***IP addressing scheme*** is performed as per industry standards. 3.1 ***Network segmentation*** is determined as per the network design. 3.3 ***Network privileges*** are allocated according to the network configuration

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

1. Network security Threats & Vulnerabilities may include but not limited to;	• Malware • Phishing • Man in the middle attack • Denial of service attack • SQL injection • Weak authentication and authorization • Physical security threats
2. Network Security Controls may include but not limited to;	• Firewalls • Network segmentation • Network monitoring and logging • Authentication mechanisms
3. Firewall activities may include but not limited to;	• Packet filtering • Logging and reporting • Bandwidth management • URL Filtering
4. IP addressing scheme may include but not limited to;	• Classful addressing • Private IP addressing • Public IP addressing
5. Network segmentation may include but not limited to;	• VLANs • Subnetting • Firewalls • Physical segmentation
6. Network privileges may include but not limited to;	• Administrator privileges • User privileges • Read-only access • Remote access privileges

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.:

Required knowledge

- Network architecture
- Network components and devices
- Network security measures
- Network monitoring procedures
- Network testing procedures
- Understanding operating system
- Safety awareness
- Environmental conservation
- Workplace safety and health

Required skills

- Computer Literacy
- Critical thinking
- Communication skills
- Problem-solving skills
- Analytical skills
- Creativity and innovation
- Network testing techniques
- Network security configuration
- Network configuration techniques
- Network Monitoring
- Technical proficiency
- Project management
- Operating systems proficiency

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

1 Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Conducted computer network security assessment as per work procedure 1.2 Monitored network firewall activities as per work procedure 1.3 Performed fundamental Network Segmentation
2 Resource implications	The following resources should be provided: 2.1 Appropriately simulated environment where assessment can take place 2.2 Access to relevant work environment 2.3 Resources relevant to the proposed activities or tasks; including computers, media, routers, switches, ports etc
3 Methods of assessment	Competency in this unit may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Portfolio of evidence 3.4 Interviews 3.5 Third party report 3.6 Practical assessment 3.7 Written tests

4 Context of assessment	4.1 This Competency may be assessed in a workplace or a simulated workplace
5 Guidance information for assessment	5.1 Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.