HARDWARE AND NETWORKING SERVICE LEVEL – IV

TVET CURRICULUM

Based on December, 2021 Version-IV

Occupational standard (OS)

March, 2022

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Preface

The reformed TVET-System is an outcome-based system. It utilizes the needs of the labor market and occupational requirements from the world of work as the benchmark and standard for TVET delivery. The requirements from the world of work are analyzed and documented – taking into account international benchmarking – as occupational standards (OS).

In the reformed TVET-System, curricula and curriculum development play an important role with regard to quality driven comparable TVET-Delivery. The Curricula help to facilitate the training process in a way, that trainees acquire the set of occupational competences (skills, knowledge and attitude) required at the working place and defined in the occupational standards (OS).

This curriculum has been developed by a group of professional experts from different Regional TVET Bureaus, colleges, Institutes and universities based on the occupational standard for Hardware and Networking Service Level IV.

The curriculum development process has been actively supported and facilitated by **Ministry of Labor and Skills.**

TVET-Program Design

1.1.   TVET-Program Title: Hardware and Networking Service **Level IV**

1.2.   TVET-Program Description

The Program is designed to develop the necessary knowledge, skills and attitude of the trainees to the standard required by the occupation. The contents of this program are in line with the occupational standard. The Trainees who successfully completed the Program will be qualified to work as **Hardware and Network Middle Technical Manager** with competencies elaborated in the respective OS. Graduates of the program will have the required qualification to work in the **Economic Infrastructure** sector in the field of **Hardware and Network Service.**

The prime objective of this training program is to equip the Trainees with the identified competences specified in the OS. Graduates are therefore expected to Provide Network System Administration, Develop System Infrastructure Design Plan, and Build Internet Infrastructure; Build a small wireless LAN, Manage network security, Determine Maintenance Strategy, and Conduct/Facilitate User Training in accordance with the performance criteria and evidence guide described in the OS.

1.3.   TVET-Program Training Outcomes

The expected outputs of this program are the acquisition and implementation of the following units of competences:

> **EIS HNS4 01 1221 Provide Network System Administration**
>
> **EIS HNS4 02 1221 Develop System Infrastructure Design Plan**
>
> **EIS HNS4 03 1221 Build Internet Infrastructure**
>
> **EIS HNS4 04 1221 Build a small wireless LAN**
>
> **EIS HNS4 05 1221 Manage network security**
>
> **EIS HNS4 06 1221 Determine Maintenance Strategy**
>
> **EIS HNS4 07 1221 Conduct/Facilitate User Training**

1.4.   Duration of the TVET-Program

The Program will have duration of 300 *hours* including the on school/ Institution training and on-the-job practice or cooperative training time. Such cooperative training based on realities of the industry, nature of the occupation, location of the TVET institution, and other

factors will be considered in the training delivery to ensure that trainees acquire practical and workplace experience.

s.no	Unit competency	TVET Institution training		Cooperative training	Total hours	Remarks
		Theory	Practical			
1.	Develop System Infrastructure Design Plan	15	20	15	50	
2.	Build Internet Infrastructure	15	25	20	60	
3.	Build a small wireless LAN	10	15	15	40	
4.	Provide Network System Administration	10	20	15	45	
5.	Manage network security	10	20	15	45	
6.	Determine Maintenance Strategy	15	10	5	30	
7.	Conduct/Facilitate User Training	15	10	5	30	
Total Hours		**90**	**120**	**90**	**300**	

1.5. Qualification Level and Certification

Based on the descriptors elaborated on the Ethiopian National TVET Qualification Framework (NTQF) the qualification of this specific TVET Program is Level IV.

The trainee can exit after successfully completing the modules in one level and will be awarded the equivalent institutional certificate on the level completed. However, only institutional certificate of training accomplishment will be awarded.

1.6. Target Groups

Any citizen **with or without disability** who meets the entry requirements under items 1.7 and capable of participating in the training activities is entitled to take part in the Program.

1.7 Entry Requirements

The prospective participants of this program are required to possess the requirements or directive of the **Ministry of Labor and Skills**.

1.8 Mode of Delivery

This TVET-Program is characterized as a formal Program on middle level technical skills. The mode of delivery is co-operative training. The time spent by the trainees in the real work place/ industry will give them enough exposure to the actual world of work and enable them to get hands-on experience.

The co-operative approach will be supported with school-based lecture-discussion, simulation and actual practice. These modalities will be utilized before the trainees are exposed to the industry environment.

Hence based on the nature of the occupation, location of the TVET institutions, and interest of the industry alternative mode of cooperative training such as apprenticeships, internship and traineeship will be employed. In addition, in the areas where industry is not sufficiently available the established production and service centers/learning factories in TVET institutions will be used as cooperative training places. The Training-Institution and identified companies have forged an agreement to co-operate with regard to the implementation of this program.

1.9. TVET-Program Structure

Unit of Competence		Module Code & Title		Training Outcomes	Duration (In Hours)
EIS HNS4 02 1221	Develop System Infrastructure Design Plan	EIS HNS4 M01 0322	Developing System Infrastructure Design Plan	• Specify architecture requirements • Specify hardware and software • Conduct walk-through and compare/ contrast expected performance • Document and report on findings	50
EIS HNS4 03 1221	Build Internet Infrastructure	EIS HNS4 M02 0322	Building Internet Infrastructure	• Plan and design internet infrastructure • Install and configure internet infrastructure and services • Test security and internet access • Ensure user accounts are verified for security • Manage and support internet • Plan and Organize Work	60
EIS HNS4 04 1221	Build a small wireless LAN	EIS HNS4 M03 0322	Building a small wireless LAN	• Confirm client and equipment requirements • Select, install and configure wireless access point • Configure network • Train users • Monitor and administer wireless network	40
EIS HNS4 01 1221	Provide Network System Administration	EIS HNS4 M04 0322	Providing Network System Administration	• Provide client access and security • Provide input into and disseminate disaster recovery plan • Monitor network performance • Migrate to new technology	45

EIS HNS4 05 1221	Manage network security	EIS HNS4 M05 0322	Managing network security	- Define a process for designing security - Identify threats to network security - Analyze security risks - Create a security design - Design and implement responses to security incidents	45
EIS HNS4 06 1221	Determine Maintenance Strategy	EIS HNS4 M06 0322	Determining Maintenance Strategy	- Identify and analyze maintenance needs - Develop service level agreements - Formulate maintenance strategy - Define client and supplier processes and standards	30
EIS HNS4 07 1221	Conduct / Facilitate User Training	EIS HNS4 M07 0322	Conducting/ Facilitate User Training	- Plan ICT training system - Identify IT system training needs - Implement Training Change - Monitor and review implementation - Prepare and deliver training on use of modified system - Utilize specialized communication skills	30
				Total Hours	**300**

*The time duration (Hours) indicated for the module should include all activities in and out of the TVET institution.

1.10 Institutional Assessment

Two types of evaluation will be used in determining the extent to which training outcomes are achieved. The specific training outcomes are stated in the modules. In assessing them, verifiable and observable indicators and standards shall be used.

The *formative assessment* is incorporated in the training modules and form part of the training process. Formative evaluation provides the trainee with feedback regarding success or failure in attaining training outcomes. It identifies the specific training errors that need to be corrected, and provides reinforcement for successful performance as well. For the teacher, formative evaluation provides information for making instruction and remedial work more effective.

Summative Evaluation the other form of evaluation is given when all the modules in the program have been accomplished. It determines the extent to which competence have been achieved. And, the result of this assessment decision shall be expressed in the term of institutional Assessment implementation guidelines..

Techniques or tools for obtaining information about trainees' achievement include oral or written test, demonstration and on-site observation.

1.11 TVET Teachers Profile

The teachers conducting this particular TVET Program are A Level and above who have satisfactory practical experiences or equivalent qualifications.

LEARNING MODULE 01

TVET-PROGRAMME TITLE: Hardware and Networking Service **Level IV**

MODULE TITLE: Developing System Infrastructure Design Plan

MODULE CODE: EIS HNS4 M01 0322

NOMINAL DURATION: 50 Hours

MODULE DESCRIPTION: This module defines the competency required to specify the hardware, network, software and infrastructure required to support the system.

LEARNING OUTCOMES

At the end of the module the trainee will be able to:

LO1: Specify Architecture Requirements

LO2: Specify hardware and software

LO3: Conduct walk-through and compare/contrast expected performance

LO4: Document and report on findings

MODULE CONTENTS:

LO1: Specify Architecture Requirements

    1.1.   Identifying critical principles, functions and framework of System

    1.2.   Organizing business requirement functions

    1.3.   Identifying operational environment support

        1.3.1.   Hardware

        1.3.2.   Network

        1.3.3.   Software

    1.4.   Refining system topology model, templates and standards

        1.4.1.   Logical Topologies

        1.4.2.   Physical Topologies

    1.5.   Utilizing project architecture development

        1.5.1.   Identifying project gaps

        1.5.2.   Specifying Architecture Requirements

LO2: Specify hardware and software

    2.1.   Architecture Requirements

        2.1.1.   Evaluating various products and vendors

        2.1.2.   Determining best IT solutions

2.2. Estimating and evaluating current and future capacity and client's requirements

2.3. Identifying existing system and application requirement

LO3: Conduct walk-through and compare/contrast expected performance

3.1. Comparing requirement model

    3.1.1. Compare technical specifications and acceptance criteria

    3.1.2. Compare proposed venders offering

3.2. Benchmarking requirement model

    3.2.1. Current industry standards and IT blueprint

    3.2.2. Expect future organizational requirements

LO4: Document and report on findings

4.1. Preparing system infrastructure design plan

4.2. Documenting and referring recommendations

Learning Methods:				
For none impaired trainees	**Reasonable Adjustment for Trainees with Disability (TWD)**			
	Low Vision	**Deaf**	**Hard of hearing**	**Physical impairment**
Lecture-discussion	❖ Provide large print text ❖ Prepare the lecture in **Audio/video** ❖ Organize the class room seating arrangement to be accessible to trainees ❖ Write short notes on the black/white board using large text ❖ Make sure the luminosity of the light of class room is kept ❖ Use normal tone of voice ❖ Encourage trainees to record the lecture in audio format ❖ Provide Orientation on the physical feature of the work shop ❖ Summarize main points	❖ Assign sign language interpreter ❖ Arrange the class room seating to be conducive for eye to eye contact ❖ Make sure the luminosity of the light of class room is kept ❖ Introduce new and relevant vocabularies ❖ Use short and clear sentences ❖ Give emphasis on visual lecture and ensure the attention of the trainees ❖ Avoid movement during lecture time ❖ Present the lecture in video format	❖ Organize the class room seating arrangement to be accessible to trainees ❖ Speak loudly ❖ Ensure the attention of the trainees ❖ Present the lecture in video format ❖ Ensure the attention of the trainees	❖ Organize the class room seating arrangement to be accessible for wheelchairs users. ❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note ❖ Provide Orientation on the physical feature of the work shop

		❖ Summarize main points		
Demonstration	❖ Conduct close follow up ❖ Use verbal description ❖ Provide special attention in the process of guidance ❖ facilitate the support of peer trainees ❖ Prepare & use simulation	❖ use Sign language interpreter ❖ Use video recorded material ❖ Ensure attention of the trainees ❖ Provide structured training ❖ Show clear and short method ❖ Use gesture ❖ rovide tutorial support (if necessary)	❖ Illustrate in clear & short method ❖ Use Video recorded material ❖ Ensure the attention of the trainees ❖ rovide tutorial support (if necessary)	❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines ❖ Assign peer trainees to assist ❖ Conduct close follow up ❖ rovide tutorial support (if necessary
Group discussion	❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member ❖ Brief the thematic issues of the work	❖ Use sign language interpreters ❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member	❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member ❖ Inform the group	❖ Introduce the trainees with their peers

			members to speak loudly	
Exercise	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/practical training ❖ Introduce new and relevant vocabularies	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/ practical training	❖ Assign peer trainees ❖ Use additional nominal hours if necessary
Individual assignment	❖ prepare the assignment questions in large text ❖ Encourage the trainees to prepare and submit the assignment in large texts ❖ Make available recorded assignment questions ❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy	❖ Use sign language interpreter ❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	

ASSESSMENT METHODS:

Interview		❖ Use sign language interpreter ❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter ❖ Use short and clear questioning ❖ Time extension	❖ Speak loudly ❖ Using sign language interpreter if necessary	❖ Use written response as an option for the trainees having speech challenges
Written test	❖ Prepare the exam in large texts ❖ Use interview as an option if necessary ❖ Prepare the exam in audio format ❖ Assign human reader ❖ (if necessary) ❖ Time extension	❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers ❖ Avoid essay writing ❖ Time extension	❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.	❖ Use oral response as an option to give answer for trainees having severe upper limb impairment ❖ Time extension for trainees having severe upper limb impairment
Demonstration /Observation	❖ Brief the instruction or provide them in large text ❖ Time extension	❖ Use sign language interpreter ❖ Brief on the instruction of the exam ❖ Provide activity-based/ practical assessment method ❖ Time extension	❖ Provide activity based assessment ❖ Brief on the instruction of the exam ❖ Use loud voice ❖ Time extension	❖ Provide activity based assessment ❖ Conduct close follow up ❖ Time extension

ASSESSMENT CRITERIA:

LO1: Specify Architecture Requirements

- Critical principles, functions and framework for the system to operate across business units, are identified. taking into account the project deliverables, acceptance criteria and current IT blueprint
- Functions are organised into layers or wrappings and components to meet business requirements.
- Processing environment, the hardware, network and software required to support the operational environments are identified.
- The system topology model, templates and standards are refined to guide development
- The project guidelines, standards, models, acceptance criteria and general framework are utilised to develop the architecture

LO2: Specify hardware and software

- Various products and vendors are evaluated against the requirements of the architecture to determine the best IT solution.
- Current and future capacity requirements are estimated and evaluated against client future requirements.
- Requirements are identified for upgrade or change through analysis of software versions and interoperability status of existing system and applications.

LO3: Conduct walk-through and compare/contrast expected performance

- Requirements model are compared against technical specifications and acceptance criteria.
- Requirements model are compared against vendor proposed offering
- The requirements model benchmarked against current industry standards and IT blueprint for performance, interoperability and expected future organizational requirements.

LO4: Document and report on findings

- System infrastructure design plan are prepared including hardware, network, software and general infrastructure aspects
- Recommendations are documented and referred to the appropriate person for improvement.

Annex: Resource Requirements

	Developing System Infrastructure Design Plan (EIS HNS4 M01 0322)			
Item No.	**Category/Item**	**Description/ Specifications**	**Quantity**	**Recommended Ratio (Item: Trainee)**
A.	*Learning Materials*			
1.	TTLM	TTTLM prepared by the trainer	25	1:1
2.	Reference Books			
2.1	System Analysis, Design, and Development: Concepts, Principles, and Practices	**Author:** Charles S. Wasson **Publisher:** A John Wiley & Sons, Inc., Publication	5	1:5
3	Technical Specification document	Organization document	5	1:5
4	Acceptance criteria document	Organization document	5	1:5
5	Project deliverables document	Organization document	5	1:5
B.	*Learning Facilities & Infrastructure*			
1.	Computer Lab	Area: 35m^2	1	1:25
2.	Internet connection	Broadband	1	1:25
3.	LAN	Star topology	1	1:25
C.	*Consumable Materials*			
1.	Paper	Type: A4 Desta	1	1:25
2	Printer cartridge	For laser printer	1	1:25
D.	*Tools and Equipment's*			
1.	Projector	LCD	1	1:25
2	Computer	Desktop	25	1:1
3	Network Toolkit	Full set	5	1:5
4	Switch	24 port	5	1:5

LEARNING MODULE 02			

TVET-PROGRAMME TITLE: Hardware and Networking Service **Level IV**

MODULE TITLE: Building Internet Infrastructure

MODULE CODE: EIS HNS4 M02 0322

NOMINAL DURATION: 60 Hours

MODULE DESCRIPTION: This module defines the competence required to design and implement an infrastructure for internet services.

LEARNING OUTCOMES

At the end of the module the trainee will be able to:

LO1. Plan and design internet infrastructure

LO2. Install and configure internet infrastructure and services

LO3. Test security and internet access

LO4. Ensure user accounts are verified for security

LO5. Manage and support internet

LO6. Plan and Organize Work

MODULE CONTENTS:

LO1. Plan and design internet infrastructure

   1.1.   Introduction to Internet Infrastructure

      1.1.1   Organization's Business Needs and Functions

      1.1.2   LAN based Communication Technologies

      1.1.3   Internet Technologies

      1.1.4   Consider internet build process with OH&S requirements

   1.2.   Evaluating and confirming internet service meets business and user requirement

   1.3.   Ensuring hardware, software, and security requirements with business and user specifications

   1.4.   Determining internet protocol address allocation

LO2. Install and configure internet infrastructure and services

   2.1.   Installing and testing cables

   2.2.   Building and testing mail servers

   2.3.   Installing and configuring workstation software to access services

   2.4.   Installing necessary hardware and software of internet connection

2.5. Configuring domain names and internet protocol address

2.6. Requiring software set up to provide services

2.7. Installing and configuring software that provides internet link

LO3. Test security and internet access

3.1. Testing and verifying security access level

3.2. Monitoring and evaluating security system capability and reliability

3.3. Making system changes for protection

3.4. Confirming availability of internet access

LO4. Ensure user accounts are verified for security

4.1. Confirming user settings with security policy

4.2. Displaying legal notices for users

4.3. Checking and verifying passwords with business policies and software utility tools

LO5. Manage and support internet

5.1. Assisting management for development of internet infrastructure procedures and policies

5.2. Obtaining, installing and using management or monitoring tools and equipment's

5.3. Monitoring traffic, broadcasts, content access and hits

5.4. Optimizing internet performance based on business need

LO6. Plan and Organize Work

6.1. Setting objectives

6.1.1. Link objective to work activities with organizational aims

6.1.2. State measurable objectives with clear timeframe

6.2. Identifying and prioritizing tasks/work activity

6.3. Coordinating scheduled work activities with personnel

6.4. Implementing work plan within time frame, resources and standards

Learning Methods:				
For none impaired trainees	**Reasonable Adjustment for Trainees with Disability (TWD)**			
	Low Vision	**Deaf**	**Hard of hearing**	**Physical impairment**
Lecture-discussion	❖ Provide large print text ❖ Prepare the lecture in **Audio/video** ❖ Organize the class room seating arrangement to be accessible to trainees ❖ Write short notes on the black/white board using large text ❖ Make sure the luminosity of the light of class room is kept ❖ Use normal tone of voice ❖ Encourage trainees to record the lecture in audio format ❖ Provide Orientation on the physical feature of the work shop ❖ Summarize main points	❖ Assign sign language interpreter ❖ Arrange the class room seating to be conducive for eye to eye contact ❖ Make sure the luminosity of the light of class room is kept ❖ Introduce new and relevant vocabularies ❖ Use short and clear sentences ❖ Give emphasis on visual lecture and ensure the attention of the trainees ❖ Avoid movement during lecture time ❖ Present the lecture in video format	❖ Organize the class room seating arrangement to be accessible to trainees ❖ Speak loudly ❖ Ensure the attention of the trainees ❖ Present the lecture in video format ❖ Ensure the attention of the trainees	❖ Organize the class room seating arrangement to be accessible for wheelchairs users. ❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note ❖ Provide Orientation on the physical feature of the work shop

		❖ Summarize main points		
Demonstration	❖ Conduct close follow up ❖ Use verbal description ❖ Provide special attention in the process of guidance ❖ facilitate the support of peer trainees ❖ Prepare & use simulation	❖ use Sign language interpreter ❖ Use video recorded material ❖ Ensure attention of the trainees ❖ Provide structured training ❖ Show clear and short method ❖ Use gesture ❖ rovide tutorial support (if necessary)	❖ Illustrate in clear & short method ❖ Use Video recorded material ❖ Ensure the attention of the trainees ❖ rovide tutorial support (if necessary)	❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines ❖ Assign peer trainees to assist ❖ Conduct close follow up ❖ rovide tutorial support (if necessary
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			members to speak loudly	
Exercise	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/practical training ❖ Introduce new and relevant vocabularies	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/ practical training	❖ Assign peer trainees ❖ Use additional nominal hours if necessary
Individual assignment	❖ prepare the assignment questions in large text ❖ Encourage the trainees to prepare and submit the assignment in large texts ❖ Make available recorded assignment questions ❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy	❖ Use sign language interpreter ❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	

ASSESSMENT METHODS:				
Interview		❖ Use sign language interpreter ❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter ❖ Use short and clear questioning ❖ Time extension	❖ Speak loudly ❖ Using sign language interpreter if necessary	❖ Use written response as an option for the trainees having speech challenges
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Demonstration /Observation	❖ Brief the instruction or provide them in large text ❖ Time extension	❖ Use sign language interpreter ❖ Brief on the instruction of the exam ❖ Provide activity-based/ practical assessment method ❖ Time extension	❖ Provide activity based assessment ❖ Brief on the instruction of the exam ❖ Use loud voice ❖ Time extension	❖ Provide activity based assessment ❖ Conduct close follow up ❖ Time extension

ASSESSMENT CRITERIA:

LO1. Plan and design internet infrastructure

- Internet infrastructure is selected in line with business and end-user requirements, within budget limitations.
- The internet service is evaluated for satisfactory performance and confirmed that the service meets business and end-user requirements.
- Hardware, software, network and security requirements are ensured in accordance with agreed business and end-user specifications.
- Internet protocol address allocation is determined based on the number of addresses needed.

LO2. Install and configure internet infrastructure and services

- Cables is installed and tested where appropriate according to the standard.
- Mail servers is built and tested when needed.
- Workstation software is installed and configured to access services
- Necessary hardware and software is installed to connect the internet to intranets or network if required.
- Domain names and internet protocol addresses is configured to make internet access possible.
- Software is set up to provide services as required. Software is installed and configured that provides internet links with existing databases, documents and files.

LO3. Test security and internet access

- Security access levels is tested and verified based on security policy.
- Capability and reliability of security systems is monitored and evaluated based on security policy.
- Changes are made to system to ensure protection against known and potential threats.
- Availability of the internet access to all clients is confirmed

LO4. Ensure user accounts are verified for security

- User settings are verified to ensure that they conform to security policies.
- Legal notices are displayed at appropriate locations for system users.

- Passwords are checked in accordance with business policies and verified with software utility tools.

LO5. Manage and support internet

- Management is assisted in developing procedures and policies for maintaining the internet infrastructure.
- Management or Monitoring tools are obtained, installed and used to assist in internet administration.
- Traffic, appropriateness of broadcasts, content access and hits are monitored over the internet. Internet performance is optimized in accordance with business need.

LO6. Plan and Organize Work

- Objectives are consistent with and linked to work activities in accordance with organizational aims.
- Objectives are stated as measurable targets with clear time frames
- Tasks/work activities to be completed are identified and prioritized as directed
- Schedule of work activities is coordinated with personnel concerned
- Work plans are implemented in accordance with set time frames, resources and standards.

Annex: Resource Requirements

Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
Building Internet Infrastructure (EIS HNS4 M02 0322)				
A.	*Learning Materials*			
1.	TTLM	TTTLM prepared by the trainer	25	1:1
2.	Reference Books			
2.1	Internet Infrastructure: Networking, Web Services, and Cloud Computing 1st edition	**Authors:** Richard Fox, & Wei Hao	5	1:5
B.	*Learning Facilities & Infrastructure*			
1.	Computer Lab	Area: 35m^2	1	1:25
2.	Internet connection	Broadband	1	1:25
3.	LAN	Star topology	1	1:25
C.	*Consumable Materials*			
1.	Paper	Type: A4 Desta	1	1:25
2	Printer cartridge	For laser printer	1	1:25
D.	*Tools and Equipment's*			
1.	Projector	LCD	1	1:25
2	Computer	Desktop	25	1:1
3	Network Toolkit		5	1:5
4	Switch	24 port	5	1:5

TVET-PROGRAMME TITLE: Hardware and Networking Service **Level IV**
MODULE TITLE: Building a Small Wireless Local Area Network
MODULE CODE: <u>EIS HNS4 M03 0322</u>
NOMINAL DURATION: 40 Hours
MODULE DESCRIPTION: This module describes the performance outcomes, skills and knowledge required to build and arrange connectivity to basic wireless local area network (WLAN).
LEARNING OUTCOMES At the end of the module the trainee will be able to: **LO1:** Confirm client and equipment requirements **LO2:** Select, install and configure wireless access point **LO3:** Configure network **LO4:** Train users **LO5:** Monitor and administer wireless network

MODULE CONTENTS:
 	
LO1: Confirm client and equipment requirements
 	
    1.1 identifying, clarifying and organizing client requirements according to network needs and organizational requirements
 	
    1.2 Assigning appropriate authority person for wireless network access
 	
    1.3 preparing wireless device technical requirements
 	
    1.4 Identifying components to be installed to meet the technical requirements
 	
    1.5 Selecting appropriate position for access point
 	
    1.6 Arranging for preliminary work to be carried out to meet cabling and power requirements
 	
LO2: Select, install and configure wireless access point
 	
    2.1 Selecting access point device based on current and future client needs
 	
    2.2 Installing and configure access points
 	
    2.3 Configuring services
 	
    2.4 Testing access point for connection and security
 	
    2.5 Upgrading legacy equipment

LO3: Configure network

3.1 Introduction to Wireless Security Threats
3.2 Configuring security and other key parameters

3.3 Testing security and firewall arrangements

3.4 Testing network compatibility and access

LO4: Train users

4.1 Determining devices to be connected to the network

4.2 Demonstrating how pairing and log-on arrangements are established to user

4.3 Informing users of wireless network etiquette and traffic capacity issues

4.4 Developing user documentation

LO5: Monitor and administer wireless network

5.1 Monitoring wireless network performance

5.2 Debugging networking issues

5.3 Documenting and storing securely current settings.

Learning Methods:				
For none impaired trainees	**Reasonable Adjustment for Trainees with Disability (TWD)**			
	Low Vision	**Deaf**	**Hard of hearing**	**Physical impairment**
Lecture-discussion	❖ Provide large print text ❖ Prepare the lecture in **Audio/video** ❖ Organize the class room seating arrangement to be accessible to trainees ❖ Write short notes on the black/white board using large text ❖ Make sure the luminosity of the light of class room is kept ❖ Use normal tone of voice ❖ Encourage trainees to record the lecture in audio format ❖ Provide Orientation on the physical feature of the work shop ❖ Summarize main points	❖ Assign sign language interpreter ❖ Arrange the class room seating to be conducive for eye to eye contact ❖ Make sure the luminosity of the light of class room is kept ❖ Introduce new and relevant vocabularies ❖ Use short and clear sentences ❖ Give emphasis on visual lecture and ensure the attention of the trainees ❖ Avoid movement during lecture time ❖ Present the lecture in video format	❖ Organize the class room seating arrangement to be accessible to trainees ❖ Speak loudly ❖ Ensure the attention of the trainees ❖ Present the lecture in video format ❖ Ensure the attention of the trainees	❖ Organize the class room seating arrangement to be accessible for wheelchairs users. ❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note ❖ Provide Orientation on the physical feature of the work shop

		❖ Summarize main points		
Demonstration	❖ Conduct close follow up ❖ Use verbal description ❖ Provide special attention in the process of guidance ❖ facilitate the support of peer trainees ❖ Prepare & use simulation	❖ use Sign language interpreter ❖ Use video recorded material ❖ Ensure attention of the trainees ❖ Provide structured training ❖ Show clear and short method ❖ Use gesture ❖ rovide tutorial support (if necessary)	❖ Illustrate in clear & short method ❖ Use Video recorded material ❖ Ensure the attention of the trainees ❖ rovide tutorial support (if necessary)	❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines ❖ Assign peer trainees to assist ❖ Conduct close follow up ❖ rovide tutorial support (if necessary
Group discussion	❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member ❖ Brief the thematic issues of the work	❖ Use sign language interpreters ❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member	❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member ❖ Inform the group	❖ Introduce the trainees with their peers

			members to speak loudly	
Exercise	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/practical training ❖ Introduce new and relevant vocabularies	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/ practical training	❖ Assign peer trainees ❖ Use additional nominal hours if necessary
Individual assignment	❖ prepare the assignment questions in large text ❖ Encourage the trainees to prepare and submit the assignment in large texts ❖ Make available recorded assignment questions ❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy	❖ Use sign language interpreter ❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	

ASSESSMENT METHODS:				
Interview		❖ Use sign language interpreter ❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter ❖ Use short and clear questioning ❖ Time extension	❖ Speak loudly ❖ Using sign language interpreter if necessary	❖ Use written response as an option for the trainees having speech challenges
Written test	❖ Prepare the exam in large texts ❖ Use interview as an option if necessary ❖ Prepare the exam in audio format ❖ Assign human reader ❖ (if necessary) ❖ Time extension	❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers ❖ Avoid essay writing ❖ Time extension	❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.	❖ Use oral response as an option to give answer for trainees having severe upper limb impairment ❖ Time extension for trainees having severe upper limb impairment
Demonstration /Observation	❖ Brief the instruction or provide them in large text ❖ Time extension	❖ Use sign language interpreter ❖ Brief on the instruction of the exam ❖ Provide activity-based/ practical assessment method ❖ Time extension	❖ Provide activity based assessment ❖ Brief on the instruction of the exam ❖ Use loud voice ❖ Time extension	❖ Provide activity based assessment ❖ Conduct close follow up ❖ Time extension

ASSESSMENT CRITERIA:

LO1: Confirm client and equipment requirements

- Identify, clarify and organize client requirements according to network needs and organizational requirements
- Ensure an appropriate person has given the authority for wireless network access
- Evaluate requirements along with business needs and translate into technical requirements
- Identify components to be installed in order to meet the technical requirements
- Select position for access point, based on user requirements and environmental conditions
- Arrange for preliminary work to be carried out to meet cabling and power requirements

LO2: Select, install and configure wireless access point

- Select access point device based on current and future client needs
- Install and configure access point to provide wireless access to network
- Configure services
- Test access point and verify wireless connection and security arrangements
- Select, install and configure appropriate wireless card where necessary for legacy equipment

LO3: Configure network

- Configure security and other key parameters consistent with commercial and business requirements
- Test security and firewall arrangements with appropriate test equipment
- Test the network with user equipment for general compatibility and access

LO4: Train users

- Determine devices to be connected to the network
- Demonstrate how pairing and log-on arrangements are established to user
- Inform users of wireless network etiquette and traffic capacity issues
- Develop user documentation

LO5: Monitor and administer wireless network

- Monitor wireless network performance using diagnostic tools
- Debug networking issues to maintain trouble-free wireless connection
- Document current settings and store securely

Annex: Resource Requirements

Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
Building a Small Wireless Local Area Network (EIS HNS4 M03 0322)				
A.	*Learning Materials*			
1.	TTLM	TTTLM prepared by the trainer	25	1:1
2.	Reference Books			
2.1	Internet Infrastructure: Networking, Web Services, and Cloud Computing 1st edition	**Authors:** Richard Fox, & Wei Hao	5	1:5
B.	*Learning Facilities & Infrastructure*			
1.	Computer Lab	Area: 35m^2	1	1:25
2.	Internet connection	Broadband	1	1:25
3.	LAN	Star topology	1	1:25
C.	*Consumable Materials*			
1.	Paper	Type: A4 Desta	1	1:25
2	Printer cartridge	For laser printer	1	1:25
D.	*Tools and Equipment's*			
1.	Projector	LCD	1	1:25
2	Computer	Desktop	25	1:1
3	Network Toolkit		5	1:5
4	Switch	24 port	5	1:5

	LEARNING MODULE 04	

TVET-PROGRAMME TITLE: Hardware and Networking Service **Level IV**

MODULE TITLE: Providing network systems administration

MODULE CODE: EIS HNS4 M04 0322

NOMINAL DURATION: 45 Hours

MODULE DESCRIPTION: This module defines the competence required to design and implement an infrastructure for internet services.

LEARNING OUTCOMES

At the end of the module the trainee will be able to:

LO1. Provide client access and security

LO2. Provide input into and disseminate disaster recovery plan

LO3. Monitor network performance

LO4. Migrate to New Technology

MODULE CONTENTS:

LO1. Provide client access and security

    1.1 Overview of Network System Administration

    1.2 Providing appropriate privilege for accounts and files

    1.3 determining access privileges and usage for user accounts

    1.4 Maintaining System integrity and security

LO2. Provide input into and disseminate disaster recovery plan

    2.1 Providing input to organization's disaster recovery plan

    2.2 Performing regular backup and restore based on disaster recovery policy

    2.3 Disseminating disaster recovery plan

LO3. **Monitor network performance**

    3.1 Performing diagnostic test to monitor network

    3.2 Analyzing and responding to diagnostic information

    3.3 Monitoring software and files

        3.3.1 Delete illegal software and files

        3.3.2 Archive files

    3.4 Monitoring performance indicators

3.5 Improving network and systems efficiency

LO4. Migrate to New Technology

4.1 Identifying situations for developing new skills.

4.2 Acquiring New or upgraded technology skills

4.3 Identifying new or upgraded equipment.

4.4 Using functions of new or upgraded equipment

4.5 Using Sources of information relating to new or upgraded equipment

4.6 Seeking Feedback from users.

Learning Methods:				
For none **impaired** **trainees**	**Reasonable Adjustment for Trainees with Disability (TWD)**			
	Low Vision	**Deaf**	**Hard of hearing**	**Physical impairment**
Lecture-discussion	❖ Provide large print text ❖ Prepare the lecture in **Audio/video** ❖ Organize the class room seating arrangement to be accessible to trainees ❖ Write short notes on the black/white board using large text ❖ Make sure the luminosity of the light of class room is kept ❖ Use normal tone of voice ❖ Encourage trainees to record the lecture in audio format ❖ Provide Orientation on the physical feature of the work shop ❖ Summarize main points	❖ Assign sign language interpreter ❖ Arrange the class room seating to be conducive for eye to eye contact ❖ Make sure the luminosity of the light of class room is kept ❖ Introduce new and relevant vocabularies ❖ Use short and clear sentences ❖ Give emphasis on visual lecture and ensure the attention of the trainees ❖ Avoid movement during lecture time ❖ Present the lecture in video format	❖ Organize the class room seating arrangement to be accessible to trainees ❖ Speak loudly ❖ Ensure the attention of the trainees ❖ Present the lecture in video format ❖ Ensure the attention of the trainees	❖ Organize the class room seating arrangement to be accessible for wheelchairs users. ❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note ❖ Provide Orientation on the physical feature of the work shop

		❖ Summarize main points		
Demonstration	❖ Conduct close follow up ❖ Use verbal description ❖ Provide special attention in the process of guidance ❖ facilitate the support of peer trainees ❖ Prepare & use simulation	❖ use Sign language interpreter ❖ Use video recorded material ❖ Ensure attention of the trainees ❖ Provide structured training ❖ Show clear and short method ❖ Use gesture ❖ rovide tutorial support (if necessary)	❖ Illustrate in clear & short method ❖ Use Video recorded material ❖ Ensure the attention of the trainees ❖ rovide tutorial support (if necessary)	❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines ❖ Assign peer trainees to assist ❖ Conduct close follow up ❖ rovide tutorial support (if necessary
Group discussion	❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member ❖ Brief the thematic issues of the work	❖ Use sign language interpreters ❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member	❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member ❖ Inform the group	❖ Introduce the trainees with their peers

			members to speak loudly	
Exercise	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/practical training ❖ Introduce new and relevant vocabularies	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/ practical training	❖ Assign peer trainees ❖ Use additional nominal hours if necessary
Individual assignment	❖ prepare the assignment questions in large text ❖ Encourage the trainees to prepare and submit the assignment in large texts ❖ Make available recorded assignment questions ❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy	❖ Use sign language interpreter ❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	

ASSESSMENT METHODS:				
Interview		❖ Use sign language interpreter ❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter ❖ Use short and clear questioning ❖ Time extension	❖ Speak loudly ❖ Using sign language interpreter if necessary	❖ Use written response as an option for the trainees having speech challenges
Written test	❖ Prepare the exam in large texts ❖ Use interview as an option if necessary ❖ Prepare the exam in audio format ❖ Assign human reader ❖ (if necessary) ❖ Time extension	❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers ❖ Avoid essay writing ❖ Time extension	❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.	❖ Use oral response as an option to give answer for trainees having severe upper limb impairment ❖ Time extension for trainees having severe upper limb impairment
Demonstration /Observation	❖ Brief the instruction or provide them in large text ❖ Time extension	❖ Use sign language interpreter ❖ Brief on the instruction of the exam ❖ Provide activity-based/ practical assessment method ❖ Time extension	❖ Provide activity based assessment ❖ Brief on the instruction of the exam ❖ Use loud voice ❖ Time extension	❖ Provide activity based assessment ❖ Conduct close follow up ❖ Time extension

ASSESSMENT CRITERIA:

LO1. Provide client access and security

- Provide logons, passwords and applications file access to users and prepare documentation in line with organizational requirements

- Examine records of user accounts to determine access privileges and usage

- Take necessary action to ensure maintenance of system integrity and security

LO2. Provide input into and disseminate disaster recovery plan

- Provide input into the organization's disaster recovery plan

- Disseminate disaster recovery plan to users as required

LO3. Monitor network performance

- Perform diagnostic tests associated with administering the network or system

- Analyze and respond to diagnostic information

- Monitor software usage, including inappropriate or illegal use

- Delete illegal software from the system

- Monitor hardware response time and other performance indicators

- Determine and action methods for improving network and systems efficiency according to organizational guidelines

LO4. Migrate to New Technology

- Situations are identified where existing knowledge can be used as the basis for developing new skills.

- New or upgraded technology skills are acquired and used to enhance learning and equipment are identified, classified and used where appropriate, for the benefit of the organization.

- Features of new or upgraded equipment are and software applied within the organization

- Features and functions of new or upgraded equipment is used for solving organizational problems

- Sources of information is accessed and used relating to new or upgraded equipment

- Feedback is sought from users where appropriate.

Annex: Resource Requirements

Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
		Providing Network Systems Administration (EIS HNS4 M04 0322)		
A.	*Learning Materials*			
1.	TTLM	TTTLM prepared by the trainer	25	1:1
2.	Reference Books			
2.1	Internet Infrastructure: Networking, Web Services, and Cloud Computing 1st edition	**Authors:** Richard Fox, & Wei Hao	5	1:5
B.	*Learning Facilities & Infrastructure*			
1.	Computer Lab	Area: 35m^2	1	1:25
2.	Internet connection	Broadband	1	1:25
3.	LAN	Star topology	1	1:25
C.	*Consumable Materials*			
1.	Paper	Type: A4 Desta	1	1:25
2	Printer cartridge	For laser printer	1	1:25
D.	*Tools and Equipment's*			
1.	Projector	LCD	1	1:25
2	Computer	Desktop	25	1:1
3	Network Toolkit		5	1:5
4	Switch	24 port	5	1:5

LEARNING MODULE 05
TVET-PROGRAMME TITLE: Hardware and Networking Service **Level IV**
MODULE TITLE: Managing Network Security
MODULE CODE: <u>EIS HNS4 M05 0322</u>
NOMINAL DURATION: 45 Hours
MODULE DESCRIPTION: This unit describes the performance outcomes, skills and knowledge required to implement and manage security functions throughout network.
LEARNING OUTCOMES At the end of the module the trainee will be able to: **LO1:** Define a process for designing security **LO2:** Identify threats to network security **LO3:** Analyze security risks **LO4:** Create a security design **LO5:** Design and implement responses to security incidents

MODULE CONTENTS:
 	
LO1: Define a process for designing security
 	
    1.1 Introduction to network security design
 	
    1.2 Defining network security design phases
 	
        1.2.1 planning phase
 	
        1.2.2 building phase
 	
        1.2.3 managing phase
 	
LO2: Identifying threats to network security
 	
    2.1 Determining attacks of network security
 	
        2.1.1 Security Attackers
 	
        2.1.2 Causes of Security Attackers
 	
        2.1.3 Mechanisms of Security Attackers
 	
    2.2 Analyzing common network vulnerabilities
 	
    2.3 Designing a threat model to categorize treats
 	
LO3: Analyze security risks
 	
    3.1 Determining elements of risk management

3.2 Determining assets that require protection

3.3 Categorizing assets and calculating their value to the organization

3.4 Creating a risk management plan

LO4: Create a security design

4.1 Determining attacker scenarios and threats

4.2 Designing security measures for network components

4.3 Obtaining feedback and adjust if required

4.4 Developing security policies

LO5: Design and implement responses to security incidents

5.1 Designing auditing and incident response procedure

5.2 Documenting security incidents

5.3 Implementing configurations aligned with incident response procedure design

5.4 Testing and signing off

Learning Methods:				
For none impaired trainees	**Reasonable Adjustment for Trainees with Disability (TWD)**			
	Low Vision	**Deaf**	**Hard of hearing**	**Physical impairment**
Lecture-discussion	❖ Provide large print text ❖ Prepare the lecture in **Audio/video** ❖ Organize the class room seating arrangement to be accessible to trainees ❖ Write short notes on the black/white board using large text ❖ Make sure the luminosity of the light of class room is kept ❖ Use normal tone of voice ❖ Encourage trainees to record the lecture in audio format ❖ Provide Orientation on the physical feature of the work shop ❖ Summarize main points	❖ Assign sign language interpreter ❖ Arrange the class room seating to be conducive for eye to eye contact ❖ Make sure the luminosity of the light of class room is kept ❖ Introduce new and relevant vocabularies ❖ Use short and clear sentences ❖ Give emphasis on visual lecture and ensure the attention of the trainees ❖ Avoid movement during lecture time ❖ Present the lecture in video format	❖ Organize the class room seating arrangement to be accessible to trainees ❖ Speak loudly ❖ Ensure the attention of the trainees ❖ Present the lecture in video format ❖ Ensure the attention of the trainees	❖ Organize the class room seating arrangement to be accessible for wheelchairs users. ❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note ❖ Provide Orientation on the physical feature of the work shop

		❖ Summarize main points		
Demonstration	❖ Conduct close follow up ❖ Use verbal description ❖ Provide special attention in the process of guidance ❖ facilitate the support of peer trainees ❖ Prepare & use simulation	❖ use Sign language interpreter ❖ Use video recorded material ❖ Ensure attention of the trainees ❖ Provide structured training ❖ Show clear and short method ❖ Use gesture ❖ rovide tutorial support (if necessary)	❖ Illustrate in clear & short method ❖ Use Video recorded material ❖ Ensure the attention of the trainees ❖ rovide tutorial support (if necessary)	❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines ❖ Assign peer trainees to assist ❖ Conduct close follow up ❖ rovide tutorial support (if necessary
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			members to speak loudly	
Exercise	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/practical training ❖ Introduce new and relevant vocabularies	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/ practical training	❖ Assign peer trainees ❖ Use additional nominal hours if necessary
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ASSESSMENT METHODS:				
Interview		❖ Use sign language interpreter ❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter ❖ Use short and clear questioning ❖ Time extension	❖ Speak loudly ❖ Using sign language interpreter if necessary	❖ Use written response as an option for the trainees having speech challenges
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Demonstration /Observation	❖ Brief the instruction or provide them in large text ❖ Time extension	❖ Use sign language interpreter ❖ Brief on the instruction of the exam ❖ Provide activity-based/ practical assessment method ❖ Time extension	❖ Provide activity based assessment ❖ Brief on the instruction of the exam ❖ Use loud voice ❖ Time extension	❖ Provide activity based assessment ❖ Conduct close follow up ❖ Time extension

ASSESSMENT CRITERIA:

LO1: Define a process for designing security

- Define planning phase for network security design

- Define building phase for network security design

- Define managing phase for network security design

LO2: Identify threats to network security

- Determine why attacks occur

- Determine who the attack may come from

- Analyze common types of network vulnerabilities

- Determine how attacks occur

- Design a threat model to categorize treats

LO3: Analyze security risks

- Determine elements of risk management

- Determine assets that require protection

- Categorize assets and calculate their value to the organization

- Create a risk management plan

LO4: Create a security design

- Determine attacker scenarios and threats

- Design security measures for network components

- Obtain feedback and adjust if required

- Develop security policies

LO5: Design and implement responses to security incidents

- Design auditing and incident response procedure

- Document security incidents

- Implement configurations aligned with incident response procedure design

- Test and sign off

Annex: Resource Requirements

<table>
<tr><td colspan="5" align="center">Managing Network Security (EIS HNS4 M05 0322)</td></tr>
<tr><th>Item No.</th><th>Category/Item</th><th>Description/ Specifications</th><th>Quantity</th><th>Recommended Ratio (Item: Trainee)</th></tr>
<tr><td>A.</td><td>*Learning Materials*</td><td></td><td></td><td></td></tr>
<tr><td>1.</td><td>TTLM</td><td>TTTLM prepared by the trainer</td><td>25</td><td>1:1</td></tr>
<tr><td>2.</td><td>Reference Books</td><td></td><td></td><td></td></tr>
<tr><td>2.1</td><td>System Analysis, Design, and Development: Concepts, Principles, and Practices</td><td>**Author:** Charles S. Wasson **Publisher:** A John Wiley & Sons, Inc., Publication</td><td>5</td><td>1:5</td></tr>
<tr><td>3</td><td>Technical Specification document</td><td>Organization document</td><td>5</td><td>1:5</td></tr>
<tr><td>4</td><td>Acceptance criteria document</td><td>Organization document</td><td>5</td><td>1:5</td></tr>
<tr><td>5</td><td>Project deliverables document</td><td>Organization document</td><td>5</td><td>1:5</td></tr>
<tr><td>B.</td><td>*Learning Facilities & Infrastructure*</td><td></td><td></td><td></td></tr>
<tr><td>1.</td><td>Computer Lab</td><td>Area: 35m^2</td><td>1</td><td>1:25</td></tr>
<tr><td>2.</td><td>Internet connection</td><td>Broadband</td><td>1</td><td>1:25</td></tr>
<tr><td>3.</td><td>LAN</td><td>Star topology</td><td>1</td><td>1:25</td></tr>
<tr><td>C.</td><td>*Consumable Materials*</td><td></td><td></td><td></td></tr>
<tr><td>1.</td><td>Paper</td><td>Type: A4 Desta</td><td>1</td><td>1:25</td></tr>
<tr><td>2</td><td>Printer cartridge</td><td>For laser printer</td><td>1</td><td>1:25</td></tr>
<tr><td>D.</td><td>*Tools and Equipments*</td><td></td><td></td><td></td></tr>
<tr><td>1.</td><td>Projector</td><td>LCD</td><td>1</td><td>1:25</td></tr>
<tr><td>2</td><td>Computer</td><td>Desktop</td><td>25</td><td>1:1</td></tr>
<tr><td>3</td><td>Network Toolkit</td><td></td><td>5</td><td>1:5</td></tr>
<tr><td>4</td><td>Switch</td><td>24 port</td><td>5</td><td>1:5</td></tr>
</table>

	LEARNING MODULE 06	

TVET-PROGRAMME TITLE: Hardware and Networking Service **Level IV**

MODULE TITLE: Determining Maintenance Strategy

MODULE CODE: EIS HNS4 M06 0322

NOMINAL DURATION: 30 Hours

MODULE DESCRIPTION: This module defines the competence required to determine and operationalize maintenance strategies and supporting processes to achieve continuity of IT operations and business functions.

LEARNING OUTCOMES

At the end of the module the trainee will be able to:

LO1. Identify and analyze maintenance needs

LO2. Develop service level agreements

LO3. Formulate maintenance strategy

LO4. Define client and supplier processes and standards

MODULE CONTENTS:

LO1. Identify and analyze maintenance needs

1.1. Identifying risks to business continuity

1.2. Reviewing systems architecture and configuration documentation for currency

1.3. Conducting equipment and/or software audit

1.4. Determining and documenting warranty status of components and/or software

    1.4.1. Vendor requirements

    1.4.2. Project or organizational requirements

1.5. Identifying critical components and/or software and document recommendation

1.6. Documenting identified risks and problems

1.7. Developing recommended maintenance solutions meet to business needs

LO2. Develop service level agreements

2.1. Determining client views and requirements in order to maintenance requirements

2.2. Preparing service-level agreement to match client and business requirements

LO3. Formulate maintenance strategy

3.1. Exam maintenance options and identify a specific maintenance strategy

3.1.1. Cost constraints

3.1.2. Risks to business continuity

3.1.3. Services level agreement

3.2. Negotiating a maintenance strategy with client and changes to service-level agreement

3.3. Documenting recommended procedure for approval from appropriate person

LO4. Define client and supplier processes and standards

4.1. Negotiating and creating reporting procedures for service requests with client and suppliers

4.2. Determining response time standards with client and suppliers

4.3. Creating escalation procedures with client and suppliers

4.4. Setting help desk or other support function based on agreed standards and procedures

Learning Methods:				
For none impaired trainees	**Reasonable Adjustment for Trainees with Disability (TWD)**			
	Low Vision	**Deaf**	**Hard of hearing**	**Physical impairment**
Lecture-discussion	❖ Provide large print text ❖ Prepare the lecture in **Audio/video** ❖ Organize the class room seating arrangement to be accessible to trainees ❖ Write short notes on the black/white board using large text ❖ Make sure the luminosity of the light of class room is kept ❖ Use normal tone of voice ❖ Encourage trainees to record the lecture in audio format ❖ Provide Orientation on the physical feature of the work shop ❖ Summarize main points	❖ Assign sign language interpreter ❖ Arrange the class room seating to be conducive for eye to eye contact ❖ Make sure the luminosity of the light of class room is kept ❖ Introduce new and relevant vocabularies ❖ Use short and clear sentences ❖ Give emphasis on visual lecture and ensure the attention of the trainees ❖ Avoid movement during lecture time ❖ Present the lecture in video format	❖ Organize the class room seating arrangement to be accessible to trainees ❖ Speak loudly ❖ Ensure the attention of the trainees ❖ Present the lecture in video format ❖ Ensure the attention of the trainees	❖ Organize the class room seating arrangement to be accessible for wheelchairs users. ❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note ❖ Provide Orientation on the physical feature of the work shop

	❖ Summarize main points		
Demonstration	❖ Conduct close follow up ❖ Use verbal description ❖ Provide special attention in the process of guidance ❖ facilitate the support of peer trainees ❖ Prepare & use simulation	❖ use Sign language interpreter ❖ Use video recorded material ❖ Ensure attention of the trainees ❖ Provide structured training ❖ Show clear and short method ❖ Use gesture ❖ rovide tutorial support (if necessary)	❖ Illustrate in clear & short method ❖ Use Video recorded material ❖ Ensure the attention of the trainees ❖ rovide tutorial support (if necessary)	❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines ❖ Assign peer trainees to assist ❖ Conduct close follow up ❖ rovide tutorial support (if necessary
Group discussion	❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member ❖ Brief the thematic issues of the work	❖ Use sign language interpreters ❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member	❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member ❖ Inform the group	❖ Introduce the trainees with their peers

			members to speak loudly	
Exercise	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/practical training ❖ Introduce new and relevant vocabularies	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/ practical training	❖ Assign peer trainees ❖ Use additional nominal hours if necessary
Individual assignment	❖ prepare the assignment questions in large text ❖ Encourage the trainees to prepare and submit the assignment in large texts ❖ Make available recorded assignment questions ❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy	❖ Use sign language interpreter ❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	

ASSESSMENT METHODS:				
Interview		❖ Use sign language interpreter ❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter ❖ Use short and clear questioning ❖ Time extension	❖ Speak loudly ❖ Using sign language interpreter if necessary	❖ Use written response as an option for the trainees having speech challenges
Written test	❖ Prepare the exam in large texts ❖ Use interview as an option if necessary ❖ Prepare the exam in audio format ❖ Assign human reader ❖ (if necessary) ❖ Time extension	❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers ❖ Avoid essay writing ❖ Time extension	❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.	❖ Use oral response as an option to give answer for trainees having severe upper limb impairment ❖ Time extension for trainees having severe upper limb impairment
Demonstration /Observation	❖ Brief the instruction or provide them in large text ❖ Time extension	❖ Use sign language interpreter ❖ Brief on the instruction of the exam ❖ Provide activity-based/ practical assessment method ❖ Time extension	❖ Provide activity based assessment ❖ Brief on the instruction of the exam ❖ Use loud voice ❖ Time extension	❖ Provide activity based assessment ❖ Conduct close follow up ❖ Time extension

ASSESSMENT CRITERIA:

LO1. Identify and analyze maintenance needs

- Risks to business continuity are identified due to system malfunction including quantification of possible loss
- Systems architecture and configuration documentation are reviewed for currency.
- Equipment and/or software audit are conducted if appropriate information is not available
- Warranty status of components and/or software according to vendor, project or organizational requirements are determined and documented
- Critical components and/or software and document recommendations are identified regarding possible service arrangements
- Identified risks and problems are documented.
- Recommended maintenance solutions are developed to meet business needs and applied to deal with the client based on the document

LO2. Develop service level agreements

- The views and requirements of the client are determined in order to identify maintenance requirements
- Service-level agreement is prepared to match client user and business requirements

LO3. Formulate maintenance strategy

- Maintenance options are examined against cost constraints, risks to business continuity and service-level agreements
- A specific maintenance strategy is identified based on cost, business and service-level agreements requirements
- A preventative maintenance schedule is created based on cost, business and service-level agreements requirements
- A maintenance strategy is negotiated with client and changes to service-level agreements are made where necessary
- The recommended procedure is documented for approval from appropriate person according to organizational requirements

LO4. Define client and supplier processes and standards

- Reporting procedures for service requests are negotiated and created with client and suppliers
- Response time standards is determined with client and suppliers
- Escalation procedures is created with client and suppliers
- Help desk or other support function is been set-up in accordance with agreed standards and procedures and in line with industry best

Annex: Resource Requirements

Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
	Determining Maintenance Strategy (EIS HNS4 M06 0322)			
A.	*Learning Materials*			
1.	TTLM	TTTLM prepared by the trainer	25	1:1
2.	Reference Books			
2.1	IT audit manual	**Authors:** Grant Thornton	5	1:5
2.2	Ten steps to results-based monitoring and evaluation system	**Authors:** Jody Zall Kusek & Ray C. Rist	5	1:5
B.	*Learning Facilities & Infrastructure*			
1.	Computer Lab	Area: 35m^2	1	1:25
2.	Internet connection	Broadband	1	1:25
3.	LAN	Star topology	1	1:25
C.	*Consumable Materials*			
1.	Paper	Type: A4 Desta	1	1:25
2	Printer cartridge	For laser printer	1	1:25
D.	*Tools and Equipment's*			
1.	Projector	LCD	1	1:25
2	Computer	Desktop	25	1:1
3	Operating system	Windows 7 and above	5	1:5
4	Switch	24 port	5	1:5
5	Printer	Laser	2	1:13

LEARNING MODULE 07
TVET-PROGRAMME TITLE: Hardware and Networking Service **Level IV**
MODULE TITLE: Conducting/Facilitating User Training
MODULE CODE: <u>EIS HNS4 M07 0322</u>
NOMINAL DURATION: 30 Hours
MODULE DESCRIPTION: This module defines the competence required to apply techniques that facilitate the working, planning, implementation and monitoring of information technology through training.
LEARNING OUTCOMES At the end of the module the trainee will be able to: **LO1:** Plan ICT training system **LO2:** Identify IT system training needs **LO3:** Implement training change **LO4:** Monitor and review implementation **LO5:** Prepare and deliver training on use of modified system **LO6:** Utilize Specialized Communication Skills
MODULE CONTENTS: **LO1: Plan ICT training system** 1.1.   Researching and developing training procedures and aim 1.2.   Developing IT training plan 1.3.   Identifying take training staffs/employees 1.4.   Training staff and management in change management procedures and polices 1.5.   Evaluating current IT training user or business pattern 1.6.   Identifying key personnel responsible for training and implementing training plan **LO2: Identify IT system training needs** 2.1.   Determining current IT training benchmarks 2.2.   Comparing identified needs to identify possible training 2.3.   Assessing proposed training to determine impact 2.4.   Notifying necessary training for key personnel **LO3: Implement training change**

3.1. Planning training schedule

3.2. Prioritizing trainings and allocate resources

3.3. Implementing training management plan and procedures

3.4. Involving high officials in the training process

3.5. Capturing new performance benchmarks to measure training

3.6. Identifying training requirements

LO4: Monitor and review implementation

4.1. Measuring training performance

4.2. Submitting performance results to higher official

4.3. Providing appropriate documentation and reporting

LO5: Prepare and deliver training on use of modified system

5.1. Preparing training meet to client needs and changed system

5.2. Delivering prepared training for appropriate client

LO6: Utilize Specialized Communication Skills

6.1. Identifying specific communication needs of trainees

6.2. Using different approaches to meet communication needs of the trainees

6.3. Establishing and review channels of communication

6.4. Researching and presenting relevant presentation in manner to promote

6.5. Utilizing appropriate media to enhance presentation

6.6. Using strategies which encourage all group members

6.7. Evaluating group communication strategies

Learning Methods:				
For none impaired trainees	**Reasonable Adjustment for Trainees with Disability (TWD)**			
	Low Vision	**Deaf**	**Hard of hearing**	**Physical impairment**
Lecture-discussion	❖ Provide large print text ❖ Prepare the lecture in **Audio/video** ❖ Organize the class room seating arrangement to be accessible to trainees ❖ Write short notes on the black/white board using large text ❖ Make sure the luminosity of the light of class room is kept ❖ Use normal tone of voice ❖ Encourage trainees to record the lecture in audio format ❖ Provide Orientation on the physical feature of the work shop ❖ Summarize main points	❖ Assign sign language interpreter ❖ Arrange the class room seating to be conducive for eye to eye contact ❖ Make sure the luminosity of the light of class room is kept ❖ Introduce new and relevant vocabularies ❖ Use short and clear sentences ❖ Give emphasis on visual lecture and ensure the attention of the trainees ❖ Avoid movement during lecture time ❖ Present the lecture in video format	❖ Organize the class room seating arrangement to be accessible to trainees ❖ Speak loudly ❖ Ensure the attention of the trainees ❖ Present the lecture in video format ❖ Ensure the attention of the trainees	❖ Organize the class room seating arrangement to be accessible for wheelchairs users. ❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note ❖ Provide Orientation on the physical feature of the work shop

		❖ Summarize main points		
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			members to speak loudly	
Exercise	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/practical training ❖ Introduce new and relevant vocabularies	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/ practical training	❖ Assign peer trainees ❖ Use additional nominal hours if necessary
Individual assignment	❖ prepare the assignment questions in large text ❖ Encourage the trainees to prepare and submit the assignment in large texts ❖ Make available recorded assignment questions ❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy	❖ Use sign language interpreter ❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	

ASSESSMENT METHODS:				
Interview		❖ Use sign language interpreter ❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter ❖ Use short and clear questioning ❖ Time extension	❖ Speak loudly ❖ Using sign language interpreter if necessary	❖ Use written response as an option for the trainees having speech challenges
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Demonstration /Observation	❖ Brief the instruction or provide them in large text ❖ Time extension	❖ Use sign language interpreter ❖ Brief on the instruction of the exam ❖ Provide activity-based/ practical assessment method ❖ Time extension	❖ Provide activity based assessment ❖ Brief on the instruction of the exam ❖ Use loud voice ❖ Time extension	❖ Provide activity based assessment ❖ Conduct close follow up ❖ Time extension

ASSESSMENT CRITERIA:

LO1: Plan ICT training system

- Training procedures and aim are researched and developed according to the organizational needs.
- IT training plan are developed
- Staffs/employees, who will take training are identified
- Staff and management are trained in change management procedures and polices
- Current IT training user or business patterns are evaluated
- Key personnel responsible are identified for training and implementing training plan

LO2: Identify IT system training needs

- Current IT training benchmarks are determined
- Identified needs are compared against performance benchmarks to identify possible training
- Proposed training are assessed to determine impact
- Key personnel re notified of necessary training

LO3: Implement training change

- Training schedule are planned
- Trainings are prioritized and resources are allocated
- Training management plan and procedures are implemented.
- High officials are involved in the training process
- New performance benchmarks are captured to measure training
- Training requirements are identified

LO4: Monitor and review implementation

- Training performance are measured against new benchmarks
- Performance results are submitted to higher officials
- Appropriate documentation and reporting are provided of the training

LO5: Prepare and deliver training on use of modified system

- Training are prepared to meet the needs of client in using the changed system
- Prepared training are delivered appropriate for the client

LO6: Utilize Specialized Communication Skills

- Specific communication needs of trainees are identified and met.

- Different approaches are used to meet communication needs of the trainees.

- Channels of communication are established and reviewed regularly.

- Communication with trainee is appropriate to individual needs and institutional objectives

- When participating in internal or external forums, presentation is relevant, appropriately researched and presented in a manner to promote the institution

- Utilize appropriate media to enhance presentation.

- Written communication is consistent with institutional standards.

- Strategies which encourage all group members to participate are used routinely.

- Evaluation of group communication strategies is undertaken to promote participation of all parties.

- Effective questioning, listening and nonverbal communication techniques are used to

Annex: Resource Requirements

	Developing System Infrastructure Design Plan (EIS HNS4 M07 0322)			
Item No.	**Category/Item**	**Description/ Specifications**	**Quantity**	**Recommended Ratio (Item: Trainee)**
A.	*Learning Materials*			
1.	TTLM	TTTLM prepared by the trainer	25	1:1
2.	Reference Books			
2.1	System Analysis, Design, and Development: Concepts, Principles, and Practices	**Author:** Charles S. Wasson **Publisher:** A John Wiley & Sons, Inc., Publication	5	1:5
3	Technical Specification document	Organization document	5	1:5
4	Acceptance criteria document	Organization document	5	1:5
5	Project deliverables document	Organization document	5	1:5
B.	*Learning Facilities & Infrastructure*			
1.	Computer Lab	Area: 35m^2	1	1:25
2.	Internet connection	Broadband	1	1:25
3.	LAN	Star topology	1	1:25
C.	*Consumable Materials*			
1.	Paper	Type: A4 Desta	1	1:25
2	Printer cartridge	For laser printer	1	1:25
D.	*Tools and Equipments*			
1.	Projector	LCD	1	1:25
2	Computer	Desktop	25	1:1
3	Network Toolkit		5	1:5
4	Switch	24 port	5	1:5

Acknowledgement

The **Ministry of Labor and Skills** wishes to thank and appreciation for the trainers who donated their effort and time to develop this outcome based curriculum for the TVET program Hardware and Networking Service Level IV. We also thank all regional TVET College for active facilitation of their trainers for the development of this curriculum.

The trainers who developed the curriculum

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