Technical and Vocational Education and Training Authority

National Competency Standard for Computer Hardware and Networking

Standard Code: ICTS01V2/20

Qualification Name: National Certificate III in Computer Hardware and Networking
Qualification Code: ICTS01Q1L3V2/20

PREFACE

Technical and Vocational Education and Training (TVET) Authority was established with the vision to develop a TVET system in the Maldives that is demand driven, accessible, beneficiary financed and quality assured, to meet the needs of society for stability and economic growth, the needs of Enterprise for a skilled and reliable workforce, the need of young people for decent jobs and the needs of workers for continuous mastery of new technology.

TVET system in the Maldives flourished with the Employment Skills Training Project (ESTP) funded by ADB with the objective of increasing the number of Maldivians, actively participating in the labor force, employed and self-employed. The Project supported expansion of demand driven employment-oriented skills training in priority occupations and to improve the capacity to develop and deliver Competency Based Skill Training (CBST). The project supported delivery of CBST programs to satisfy employer demand-driven needs. The National Competency Standards (NCS) provide the base for this training. Currently CBST is offered for five key sectors in the Maldives: Tourism, Fisheries and Agriculture, Transport, Construction and the Social sectors. These sectors are included as priority sectors that play a vital role in the continued economic growth of the country. The Ministry of Health has provided support to TVET Authority to develop National Competency Standard, instructional materials, assessment resource book and trainees log book for the National Competency Standard for "Assistant Computer Technician".

The NCS are developed in consultation with Employment Sector Councils representing employers. They are designed using a consensus format endorsed by the Maldives Qualifications Authority (MQA) to maintain uniformity of approach and the consistency of content amongst occupations. This single format also simplifies benchmarking the NCS against relevant regional and international standards. NCS specify the standards of performance of a competent worker and the various contexts in which the work may take place. NCS also describes the knowledge, skills and attitudes required in a particular occupation. They provide explicit advice to assessors and employers regarding the knowledge, skills and attitudes to be demonstrated by the candidates seeking formal recognition for the competency acquired following training or through work experience. By sharing this information, all participants in the training process have the same understanding of the training required and the standard to be reached for certification. Certification also becomes portable and can be recognized by other employers and in other countries with similar standards.

NCS are the foundation for the implementation of the TVET system in Maldives. They ensure that all skills, regardless of where or how they were developed can be assessed and recognized. They also form the foundation for certifying skills in the Maldives National Qualification Framework (MNQF).

NCS are developed by the TVET Section of Ministry of Higher Education, Employment and Social Security. The NCS are endorsed by the Employment Sector Councils of the respective sectors and validated by the Maldives Qualification Authority.

Mohamed Hashim
Minister of State for Higher Education
TVET Authority

Ahmed Nisham
Director, Standard Development & Statistics
TVET Authority

TECHNICAL PANEL MEMBERS			
#	**Name**	Designation	Organization
01	Basim Abdulla	Lecturer	Faculty of Engineering, Science and Technology
02	Shazra Mohamed Saeed	Assistant IT Service Officer	National Centre for Information Technology
03	Mohamed Naseeh	Senior Human Capital Management Executive Officer	Civil Service Commission
04	Mohamed Musad	Director Digital Transformation	Dhiraagu
05	Mohamed Latheef	Senior Lecturer	Maldives Polytechnic
06	Aminath Sakha Saleem	Computer Technician	Ministry of Health
07	Hussain Samooh	Computer Programmer	Ministry of Health

VERSION	DEVELOPER	DATE	STANDARD CODE
V1	TVET Authority	2018	SOC02S17V2
V2	Mohamed Ishan	19th October 2020	ICTS01V2/20

EMPLOYMENT SECTOR COUNCILS			
#	Name	Designation	Organization
01	Dr. Ali Fawaz Shareef	Rector	Cyryx College
02	Shafaath Habeeb	Director	Ministry of Communication, Science and Technology
03	Hussain Shifau	IT Executive	National Centre for Information Technology
04	Mariyam Asna	Executive Board Member	Women in Tech
05	Mohamed Latheef	Senior Lecturer	Maldives Polytechnic
06	Mohamed Jailam	CEO	Javaabu
07	Ibrahim Zameel	Senior Manager, Training and Development	Ooredoo

National Occupational Standard has been Endorsed by:	
 Dr. Ali Fawaz Shareef Chairperson ICT Employment Sector Council	 Shafaath Habeeb Vice-Chairperson ICT Employment Sector Council
Technical and Vocational Education and Training Authority Ministry of Higher Education Handhuvaree Hingun, M. World Dream Male', Maldives	
Date of Endorsement: 2017	Date of Revision: 19th October 2020

Standard Development Process

To ensure the standard meets the ICT sector job requirements, the process was divided in to three phases. A research phase, data analysis phase and drafting phase. First, ICT standards of Maldives and some foreign countries were reviewed. After that, Maldives ICT sector's job requirements were reviewed. Based on the data gathered, ICT standard contents were constructed. By completion of this process, the first Draft of the standard was developed.

For strengthening the development of the National Occupational Standard, a panel with technical experts was formed. The members provide technical support which needs to be included or excluded in the developed standard. If any amendment is brought to the standard, a new draft is constructed and reviewed by the technical panel, until the whole National Occupational Standard caters the needs of the ICT sector.

Once the standard is finalized among the technical panel, the standard then is submitted to the ICT Sector Council. A brief report on how National Occupational Standard for Computer Hardware and Networking was developed is presented to the Sector council. Council members than ensures that the industry need has been catered in the standard and once the standard full fills the recommendation the standard has been endorsed by the council.

After endorsing the standard from the ICT Sector Council, the final document is submitted to Maldives Qualification Authority (MQA) for approval. After the approval of MQA the National Occupational Standard for Computer Hardware and Networking is published, which would be than used by training providers.

Description of "Computer Hardware and Networking"

Like all other, qualification of the Maldivian TVET system, this occupational standard document focuses a very important segment of skilled occupations across the Maldives.

Competency standard presented here refers to an important occupation within the Information Communication Technology (ICT) Sector, which is Computer Hardware & Networking.

ICT sector plays an important role in establishing communication between individuals and corporations. Moreover, in this era of information, ICT is considered as the leading sector of securing sensitive data in digital world. Since the opportunities in ICT sector is "infinite", there are plenty of room for those who are interested to reach higher levels in this sector. For this reason, this standard is designed to cater the needs of the candidates who are interested to proceed in the field of computer hardware & networking.

From an economical aspect, it's not an option for ICT sector to be strong. Instead, it has to be strong to an extent the sector should be capable of competing at international levels. Today, ICT personal need to play an important role in every field. Financial sector and National Security sector count among highly sensitive areas. Highly trained ICT professionals are needed to secure these sectors. And it's true for all other sectors. Individuals who works as computer hardware and network technician or administrator are the ones that lay the backbone of the digital communication network, thus there are the ones who works at the frontline of defending the organizations from cyber-attacks and other various threats.

Job opportunities upon completion of "National Certificate-3 in Computer Hardware and Networking"

Upon successful completion of the National Certificate III in Computer Hardware and Networking, student can work in the following jobs.

1. *Assistant Computer Technician*
2. *IT Support Technician*
3. *Assistant IT Technician*

KEY FOR CODING

Coding Competency Standards and Related Materials

DESCRIPTION	REPRESENTED BY
Industry Sector as per ESC (Three letters)	Construction Sector (CON) Fisheries and Agriculture (FNA) Information, Communication and Technology (ICT) Transport Sector (TRN) Tourism Sector (TOU) Social Sector (SOC) Foundation (FOU)
Competency Standard	S
Occupation with in an industry sector	Two digits 01-99
Unit	U
Common Competency	CR
Core Competency	CM
Optional / Elective Competency	OP
Assessment Resources Materials	A
Learning Resources Materials	L
Curricular	C
Qualification	Q1, Q2 etc.
MNQF level of qualification	L1, L2, L3, L4 etc.
Version Number	V1, V2 etc.
Year of endorsement of standard, qualification	By "/" followed by two digits responding to the year of last review, example /20 for the year 2020

1. Endorsement Application for Qualification 01		
2. NATIONAL CERTIFICATE III IN COMPUTER HARDWARE AND NETWORKING		
3.Qualification code: ICTS01Q1L3/20		**Total Number of Credits: 40**
4. Purpose of the qualification This standard describes the performance outcomes, skills and knowledge required to work professionally in an ICT environment. This standard focuses on the application of skills and knowledge to solve a given problem in ICT field efficiently.		
5. Regulations for the qualification	National Certificate III in Computer Hardware and Networking, will be awarded to those who are competent in units 1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16	
6. Schedule of Units		
No.	**Unit Title**	**Unit Code**
Common Competencies		
01	Work effectively in an information technology environment	ICTS01CR01V2/20
02	Apply occupational health and safety procedures	ICTS01CR02V2/20
03	Install software applications	ICTS01CR03V2/20
Core Competencies		
04	Operate computer hardware	ICTS01CR04V2/20
05	Connect hardware peripherals	ICTS01CR05V2/20
06	Diagnose and Troubleshoot Computer Systems	ICTS01CR06V2/20
07	Determine client computing problems and actions	ICTS01CR07V2/20
08	Install and configure other IT related electronic devices	ICTS01CR08V2/20
09	Create and Manage Technical Documentation	ICTS01CR09V2/20
10	Maintain equipment/Software inventory	ICTS01CR10V2/20
11	Maintain System integrity	ICTS01CR11V2/20
12	Basic Computer Network configuration	ICTS01CR12V2/20
13	Install and configure Computer Networks	ICTS01CR13V2/20
14	Configure and test network security	ICTS01CR14V2/20
15	Maintain Computer Systems and Network	ICTS01CR15V2/20
16	Diagnose and Troubleshoot Computer Networks	ICTS01CR16V2/20
7.Accreditation Requirements	The training provider should demonstrate hands-on experience related to this qualification. In addition to this simulated, or actual organizational work environment should be provided.	
8. Recommended Sequencing	As appearing under the section 06	

NO	Unit Title	Code	Level	No Of Credits
01	Work effectively in an information communication technology environment	ICTS01CR01V2/20	III	01
02	Apply occupational health and safety procedures	ICTS01CR02V2/20	III	01
03	Operate computer hardware	ICTS01CR04V2/20	III	02
04	Work hardware peripherals	ICTS01CR05V2/20	III	02
05	Install software applications	ICTS01CR03V2/20	III	03
06	Diagnose and Troubleshoot Computer Systems	ICTS01CR06V2/20	III	03
07	Determine client computing problems and actions	ICTS01CR07V2/20	III	02
08	Install and configure other IT related electronic devices	ICTS01CR08V2/20	III	04
09	Create and Manage Technical Documentation	ICTS01CR09V2/20	III	02
10	Maintain equipment/Software inventory	ICTS01CR10V2/20	III	01
11	Maintain System integrity	ICTS01CR11V2/20	III	03
12	Basic Computer Network configuration	ICTS01CR12V2/20	III	03
13	Install and configure Computer Networks	ICTS01CR13V2/20	III	04
14	Configure and test network security	ICTS01CR14V2/20	III	03
15	Maintain Computer Systems and Network	ICTS01CR15V2/20	III	03
16	Diagnose and Troubleshoot Computer Networks	ICTS01CR16V2/20	III	03

Packaging of National Qualifications:

National Certificate III in Computer Hardware and Networking will be awarded to those who are competent in units 1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16

Qualification Code: ICTS01Q1L3/20

UNIT TITLE	Work effectively in an information communication technology environment				
DESCRIPTER	This unit defines the competency required to support work effectively in an information communication technology environment				
CODE	ICTS01CR01V2/20	LEVEL	III	CREDIT	01

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Comply with general ICT policies and procedures	1.1 Roles of key players of the Information Technology organization are determined and briefly explained 1.2 Career choices and options are determined 1.3 Policies and procedures are complied with, as directed by supervisor
2. Promote the organization and the ICT department in a Manner consistent with the organization mission	2.1 Role of the Information Communication Technology functions within the organization is briefly explained 2.2 Organization is promoted in a positive way
3. Identify Information Communication Technology equipment/ software and operating system supported by the organization	3.1 Information Communication Technology equipment/software and operating system supported by the organization are identified 3.2 Equipment, location and service requirements are identified according to organizational requirements
4. Identify the areas within the organization for future development	4.1 Areas that need future development is identified 4.2 Future development is carried out as directed by the supervisor 4.3 A report on development process is prepared

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

Organizational Standards

May be based upon formal, well-documented methodologies, or non-existent. For training delivery purposes, best practice examples from industry will be used.

Literacy skills

In relation to work place documentation may vary

Documentation and Reporting

Audit trails, naming standards, version control

Key player

May include but are not limited to: Information Communication Technology organizations, vendors of IT products and services, IT professional bodies, industry publications and Government Departments involved in IT industry promotion, employer organizations, relevant unions.

Clients

Variables may include but are not limited to: internal and external customers, employers and employees.

Organizational

Variables may include but are not limited to: EEO, Anti-discrimination, Occupational Health and Safety policies, Occupational Health and Safety procedures, ethical work practices

Information Communication Technology Department

The structure of the Information Technology department may be a separate branch, department, division or an integrated function of an organization.

Information Technology Components

Can include hardware, software and communications packages.

Client user

May be a department within an organization or a third party and so the relationship and ease of access will vary.

Documentation and Reporting

Audit trails, naming standards, version control.

OH&S standards

As per company, statutory and vendor requirements. Ergonomic and environmental factors must be considered during the demonstration of this competency.

Organizational Standards

May be based upon formal, well-documented methodologies, or non-existent. For training delivery purposes, best practice examples from industry will be used.

ASSESSMENT GUIDE

Forms of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam

Critical aspects for Assessment

Assessment must confirm the ability to assimilate into the Information Technology department by demonstrating organizational values through the organizational code of conduct in work place interactions.

Interdependent assessment of units

The interdependence of units of competency for assessment will vary with the particular project or scenario.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Basic principles of ethical practice when promoting the organization in a manner consistent with the organizational mission ✓ Broad knowledge of organizational code of conduct and values that are consistent with the organizational mission ✓ Basic understanding of organizational systems Current industry accepted hardware and software products with broad knowledge of general features and capabilities ✓ Broad knowledge base of vendor product directions ✓ Basic knowledge on researching and formulation a report of the research	✓ Reading and writing at a level where general workplace documents can be written and understood. ✓ Verbal communication is clear and precise, for example when explaining the role of key players in the Information Technology organization. ✓ Problem-solving is limited to basic known problems within normal routines, for example, when complying with policies and procedures as directed by supervisor ✓ Basic analysis skills in relation to normal routine work processes, for example, when complying with policies and procedures as directed by supervisor ✓ Using the features of applications, for example, when complying with policies and procedures as directed by supervisor ✓ Basic skills in interpreting technical information, for example, when complying with policies and procedures as directed by supervisor

UNITE TITLE	Apply occupational health and safety procedures				
DESCRIPTOR	This unit defines the competency required to support the organization's Occupational Health and Safety principles and practices.				
CODE	ICTS01CR02V2/20	**LEVEL**	III	**CREDIT**	01

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Determine Occupational Health and Safety (OH&S) issues relating to immediate work environment	1.1. Occupational Health and Safety issues in the immediate workplace including normal and special need staffs are assessed and action to rectify the problem is taken or reported to supervisor 1.2. Workplace and OH&S procedures are followed to ensure safe working environment
2. Document and Disseminate Occupational Health & Safety requirements	2.1. Information relating to Occupational Health and Safety regulations and requirements are obtained 2.2. OH&S regulations impacting upon the Information Communication Technology client area are determined and documented 2.3. Documents are submitted to supervisor for verification 2.4. Occupational Health and Safety documents are provided to all work stations 2.5. Occupational Health and Safety documents relating to IT are updated and re-issued as required
3. Provide basic ergonomic advice	3.1. Ergonomic requirements of clients are assessed 3.2. Advice is provided to clients based on vendor requirements, workplace policies and the latest OH&S information 3.3. Advice is documented and passed on to client and Supervisor
4. Awareness to Psychological and Social Issues of Technology	4.1 Effect of technology on psychology and social behavior of human is obtained 4.2 As direct by the supervisor, the obtained information is documented and provided to all staffs 4.3 Occupational Health and Safety documents relating to IT are updated and re-issued as required

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

Organizational

Variables may include, but are not limited to: Occupational Health and Safety legislation; organization safety procedures; work stations and work environment procedures; presence and impact of OH&S manager.

Advice on ergonomics

Includes: Occupational Health and Safety procedures; using and cleaning Visual Display Units (VDUs); advice on footrests, exercises, times for breaks, armrests, chairs, ergonomic keyboards etc.

Operating Systems

Command line and Graphical User Interface

Literacy skills
In relation to work place documentation may vary

OH, and S standard

As per company, statutory and vendor requirements. Ergonomic and environmental factors must be considered during the demonstration of this competency as well as Occupational Health and Safety guidelines related to use of screen-based equipment, computing equipment and peripherals, and ergonomic work stations, security procedures and customization requirements.

Organizational Standards

May be based upon formal, well-documented methodologies, or non-existent. For training delivery purposes, best practice examples from industry will be used.

Quality process
Some organizations may be quality certified and have well-documented standards for addressing quality while others will not.

ASSESSMENT GUIDE

Form of assessment
Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects of evidence
Assessment must confirm the ability to comply with Occupational Health and Safety requirements relating to the use of computing equipment through the practical demonstration of the identification of unsafe practices and taking action to correct them.

Interdependent assessment of units

The interdependence of units of competency for assessment will vary with the particular project or scenario.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ General ergonomic principles to avoid back, wrist and eye strain etc. ✓ Procedures and exercises for avoiding strain and injury ✓ Knowledge on special ergonomic equipment need for special need staffs. ✓ Broad knowledge on psychological and social issues of technology and ways to avoid it. ✓ Broad knowledge on new technological releases and its physical and psychological effect ✓ Current standard business practices in relation to preparing reports ✓ Broad knowledge of Organizational Health and Safety requirements in relation to work safety, environmental factors and ergonomic considerations	✓ Reading and writing are at a level where basic workplace documents are understood and presented ✓ Use of presentation applications, for example, when illustrating a health-technology related issue in an awareness session. ✓ Questioning and active listening is employed to confirm information ✓ Plain English literacy and communication skills in relation to dealing with clients and team members ✓ Problem solving skills for a defined range of predictable problems

UNIT TITLE	Operate computer Hardware				
DESCRIPTOR	This unit defines the competency required to identify, select and correctly operate basic computer hardware.				
CODE	ICTS01CR04V2/20	**LEVEL**	III	**CREDIT**	02

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Identification and assembling of the **Core Hardware**	1.1 Functions and specifications of the **core hardware** is determined 1.2 Compatible set of **core hardware** is identified from a range of hardware 1.3 Appropriate tools are selected to perform task 1.4 Assembling of the **core hardware** is carried out according to standard procedure
2. Basic settings and functions of a computer at startup is identified	2.1 Startup process of a computer system is clearly identified 2.2 Access to BIOS and its values are changed accordingly 2.3 CMOS battery is identified and changed when needed
3. Identify the devices required for a particular computer operation	3.1 Requirements of task are determined 3.2 Functions of the devices are identified 3.3 Appropriate hardware is selected to perform task
4. Use keyboard and equipment	4.1 Occupational Health and Safety regulations are followed 4.2 Keyboarding is carried out according to organization guidelines on speed and accuracy

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

Core Hardware includes:

CPU: Intel, AMD

Motherboard: Intel, Gigabyte, Dell, etc.

Storage Devices: May include but are not limited to: diskettes, CDs, zip drives, internal / external HDDs, Memory Stick etc.

Power Supply: Should support computer systems with high end or medium configuration

RAM: DDR2, DDR3, DDR4

Graphic Card: PCI Express card

Optical Devices: May include DVD ROM, Blu Ray ROM

Monitor: May include LCD, LED screens

Cables: Power cables, Data cables etc.

Chassis: Should house the internal devices

Technical instructions

Technical instructions for use of specific tools and computer hardware.

Keyboarding

Speed will vary according to different organizational requirements and different job roles within an organization. The keyboard technique will be in line with OH&S requirements for safe use of keyboards. Keyboards specialized for special need individuals should be considered.

Occupational Health and Safety

Guidelines relate to the assembling computer systems and operating, use of screen-based equipment, computing equipment and peripherals, and ergonomic workstations.

Organizational

Variables may include, but are not limited to: security procedures; Occupational Health and Safety procedures; maintenance procedures.

Quality Control

Quality of the work done should be maintained within a standard range.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects of evidence

Assessment must confirm the ability to determine, select and use hardware components and functions correctly and efficiently according to the task requirement. Hardware consumables are correctly identified and utilized according to the task requirement.

Interdependent assessment of units

The interdependence of units of competency for assessment will vary with the particular project or scenario.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ OH&S principles and responsibilities ✓ Ergonomic principles to avoid back, wrist and eye strain ✓ Procedures and exercises for avoiding strain and injury ✓ Basic knowledge of current industry accepted hardware and software products with broad knowledge of general features and capabilities	✓ Reading and writing at a level where basic workplace documents are understood ✓ Decision making skills in a narrow range of areas ✓ Problem solving skills for a defined range of predictable problems ✓ Highly adaptable to rapidly changing technology

UNIT TITLE	Connect Hardware Peripherals				
DESCRIPTOR	This unit defines the competency required to connect hardware peripherals according to given specification.				
CODE	ICTS01CR05V2/20	LEVEL	III	CREDIT	02

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Confirm requirements of client	1.1 Clients' peripheral requirements are identified and are confirmed in accordance with organization standards 1.2 Client requirements and peripherals needed in line with organizational guidelines are documented and reported to the supervisor 1.3 Client requirements are cleared with supervisor in line with organization guidelines 1.4 Client support expectations are covered by vendor's warranty and support services
2. Obtain required peripherals	2.1 Peripherals are obtained under instruction from management/supervisor 2.2 Peripherals are entered into equipment inventory according to organization's procedures 2.3 Contents are validated and method of ensuring the physical contents match the packing list is demonstrated 2.4 Peripherals are stored according to vendor/manual guidelines
3. Connect hardware peripherals	3.1 Timeframe for installation schedule is verified with higher authority 3.2 New peripherals are connected with minimal disruption to clients 3.3 Computer is configured to accept new peripherals 3.4 Hardware peripherals are tested and client satisfaction is confirmed. Amendments are made as required for client

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

Peripherals

All the computer hardware except **core hardware** are considered as Peripherals. This includes but are not limited to, Keyboard, mouse, printer, Network card, sound card, scanner, projector, biometric scanner etc.

Operating systems

Win10.

Software and Applications

Can include packaged software, in-house development or out-sourced development. The amount of maintenance, change and tailoring that can be undertaken will vary.

Configuration

Configuration includes automatic, plug and play, and manual.

Reporting procedures

Help desk and maintenance structures will vary. Some may be a call center or a general contact point which then calls a supplier or other technician. Others may be staffed by technicians capable of solving the problem. Thus, documentation and other procedures will vary. Systems to monitor change request may be manual or computerized.

Documentation and Reporting

Documentation for version control may follow ISO standards. Audit trails, naming standards, version control, project management templates and report writing styles will vary according to organizational approach. Information gathering processes may have associated templates.

Standards and Procedures

May include: formal procedures that must be adhered to with check points and sign offs with documented procedures and templates, implementation of financial control mechanisms, communication with stakeholders, dispute resolution and modification procedures, processes for determining size and cost.

OH & S Standards

As per company, statutory and vendor requirements. Ergonomic and environmental factors must be considered during the demonstration of this competency.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects of evidence

Assessment must confirm the ability to connect hardware peripherals according to vendor instructions with a minimum of down time to the system. Competency is required in the connection of five different peripherals. Ability to interpret vendor manuals in relation to the storage and connection of hardware peripherals is demonstrated. Occupational Health and Safety regulations relating to working with electrical equipment is adhered to.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Broad general knowledge of OH&S procedures for electrical equipment ✓ Detailed knowledge of inventory procedures ✓ Organizational guidelines relating to external suppliers and vendors ✓ General understanding of systems, technical terms ✓ Broad knowledge base incorporating theoretical concepts of three or more current industry accepted hardware peripherals; knowledge of general features and capabilities and detailed knowledge in some ✓ Broad knowledge base incorporating theoretical concepts of three or more current industry-accepted system components; knowledge of general features and capabilities and detailed knowledge in some ✓ Broad knowledge base incorporating theoretical concepts of operating systems ✓ Broad knowledge of help desk and maintenance practices ✓ Current industry-accepted hardware and software products with broad knowledge of general features and capabilities and detailed knowledge in some areas ✓ Broad knowledge base incorporating theoretical concepts of Input/output skills in relation to maintenance procedures and devices	✓ Customer service skills in relation to maintenance procedures ✓ Handling difficult clients ✓ Conflict resolution skills in relation to maintenance procedures ✓ Decision-making in a limited range of options ✓ Literacy in regard to general workplace documentation ✓ Problem-solving skills for a defined range of predictable problems ✓ Plain English literacy and communication skills in relation to analysis, evaluation and presentation of information ✓ Facilitation and presentation skills in relation to transferring and collecting information ✓ Negotiation skills in relation to other team members and applied to a defined range of predictable problems ✓ Report writing skills for business requiring depth in some areas, analysis and evaluation of information in a defined range of areas.

UNIT TITLE	Install Software Applications				
DESCRIPTOR	This unit defines the competency required to install software applications under instruction.				
CODE	ICTS01CR03V2/20	LEVEL	III	CREDIT	03

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Determine OS or OS upgrade requirements of client	1.1 Client requirements are documented and reported to supervisor 1.2 Supervisor's instructions to meet client requirements are acted on in line with organization guidelines, corporate purchasing, licensing arrangements, and budget.
2. Obtain OS or OS upgrade	2.1 OS is obtained under instruction from management or supervisor 2.2 Licensing requirements are determined and recorded in line with organization guidelines
3. Install OS or OS upgrade	3.1 Installation/Upgrades are installed to meet supervisor instructions 3.2 Process is undertaken so clients experience minimal disruption 3.3 Computer is installed to accept software 3.4 Testing in line with corporate guidelines are carried out 3.5 Client requirements are satisfied. 3.6 Amendments are made as required for client, or client is referred to appropriate person/ supervisor, if necessary
4. Determine and obtain application software requirements of client	4.1 Supervisor's instructions to meet client requirements are acted on in line with organization guidelines, corporate purchasing, licensing arrangements, and budget 4.2 Licensing requirements are determined and recorded in line with organization guidelines 4.3 Software is obtained under instruction from management or supervisor
5. Install application software	5.1 Process is undertaken so clients experience minimal disruption 5.2 Computer is installed to accept software 5.3 Testing in line with corporate guidelines are carried out 5.4 Client requirements are satisfied. 5.5 Amendments are made as required for client, or client is referred to appropriate person/ supervisor, if necessary

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

Software

Operating System (OS): Industries most commonly used latest stable release

Application software: May include, but are not limited to: commercial software applications; organizational specific software; word processing, spreadsheet, database, graphic etc.

Licensing: Types of software licensing may include, proprietary, copyleft, public domain etc.

Software license could be obtained through online or purchased locally.

Client user

May be a department within the organization or a third party and so the relation and ease of access will vary.

Organizational Standards

May be based upon formal, well-documented methodologies, or non-existent. For training delivery purposes, best-practice examples from industry will be used.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects of evidence

Assessment must confirm the ability of the candidate to install system software and application software through operating system instructions and to configure computer to accept new software or upgrade.

Also, the assessment should confirm the standard processes of obtaining software license.

Interdependent assessment of units

The interdependence of units of competency for assessment will vary with the particular project or scenario.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Organizational guidelines for purchasing ✓ Broad general knowledge of licensing arrangements and responsibilities ✓ Broad general knowledge of software copyright responsibilities ✓ Broad general knowledge of operating systems supported ✓ by the organization ✓ Broad general knowledge of the hardware storage devices ✓ Broad general knowledge of Input/output devices ✓ Broad general knowledge of the client business domain	✓ General customer service ✓ Decision making in a limited range of options ✓ Problem solving of known problems in routine procedures ✓ Plain English literacy and communication skills in relation to the presentation of information ✓ Report writing skills for business requiring some analysis and evaluation of information in a defined range of areas

UNIT TITLE	Diagnose and troubleshoot computer systems				
DESCRIPTOR	This unit covers the knowledge, skills and attitudes needed to diagnose computer systems and networks.				
CODE	ICTS01CR06V2/20	LEVEL	III	CREDIT	03

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan and prepare for diagnosis of faults of computer systems	1.1 Diagnosis of faults is planned and prepared in line with job requirements 1.2 OH & S policies and procedures are followed in line with job requirements 1.3 Appropriate personnel are consulted to ensure that the work is effectively coordinated 1.4 Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements 1.5 Tools, equipment and testing devices needed to carry out the work are obtained in accordance with established procedures and checked for proper operation and safety. 1.6 Computer systems defects are checked against job requirements.
2. Diagnose faults of computer systems	2.1 Appropriate personal protective equipment is used in line with standard procedures. 2.2 Faults or problems in the computer systems are diagnosed according to requirements and in line with the standard procedures. 2.3 Contingency measures are managed and implemented in accordance with established procedures 2.4 Unplanned events or conditions are responded to in accordance with established procedures
3. Rectify/correct defects in computer systems and networks	3.1 Appropriate personal protective equipment is used in line with standard procedures. 3.2 Defective components or parts are replaced or corrected without damage to the surrounding environment or services 3.3 Adjustments, if necessary are made in accordance with established procedures 3.4 Unplanned events or conditions are responded to in accordance with established procedures.
4. Test computer systems	4.1 Computer systems are tested to ensure safe operation. 4.2 Unplanned events or conditions are responded to in accordance with established procedures. 4.3 Report/s are prepared and completed according to company policy

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

OH&S Standards

Occupational Health and Safety Laws Personal Safety, Workplace Hazards and Environment Laws

Hardware

Includes but not limited to: Servers, peripherals, and desktop computers, Connectors, Adaptors, Wires and cables, appropriate software, Computer storage media

Tools

Tools for: cutting, shaping, drilling, threading, tapping, finishing, dismantling, and assembling.

Testing Devices

Testing devices includes but not limited to: Testing devices includes but not limited to: AC current Tester, Multimeter, diagnostic card etc.

Literacy skills

In regard to reporting and recording organizational documentation.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects for Assessment

Assessment must show that the candidate:

- Checked the computer systems and networks against job requirements
- Correctly diagnosed the faults and problems in the computer systems and networks according to requirements and in line with the standard procedures
- Corrected the defective components or parts of the computer systems and networks without damage to the surrounding environment or services
- Tested the computer systems and networks to ensure safe operation

Interdependent assessment of units

The interdependence of units of competency for assessment will vary with the particular project or scenario.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ OHS Use of tools ✓ Knowledge on Wiring techniques and Digital electronics ✓ Knowledge on how internal devices of a computer works. Such as, CPU, RAM, Power supply, Graphics Card, HDD, Motherboard, DVD ROM etc. ✓ Knowledge on external devices. Such as, Monitor, Keyboard/Mouse speakers, printers, scanners etc. ✓ Knowledge on Electronic fault findings ✓ Knowledge on Graphical user interface ✓ Knowledge on Data communications ✓ Knowledge on System and Application software	✓ OH&S Use of tools ✓ Problem solving skills ✓ Communication skills to identify the problem ✓ Use of Digital electronic tools ✓ Proper handling of electronic components ✓ Pinpointing faults in a system ✓ Using GUI / CLI in diagnose process. ✓ Using diagnostic tools to find faults.

UNIT TITLE	Determine client computing problems and actions				
DESCRIPTOR	This unit defines the competency required to record and priorities client support activities, determine the required resources, solve the client problem or escalating as necessary.				
CODE	ICTS01CR07V2/20	Level	III	Credit	02

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Determine client problem	1.1 Appropriate questions are asked to determine the client problem 1.2 Client problem is documented for follow up 1.3 Specific client requirements from logged requests are determined, and further appropriate investigation such as on-site visit is carried out, to gain further information
2. Prioritize client problems	2.1 Scale of problem is determined and monitored 2.2 Problem constraints are determined 2.3 Impact analysis of problem to organize is undertaken Priorities are determined 2.4 Advice and support are provided to the client from 2.5 database of known problems, if possible
3. Refer maintenance to supervisor where required	3.1 Options of referral or action are investigated and appropriate process is followed 3.2 Client help documentation is provided as required 3.3 Support and advice are documented according to organization guidelines 3.4 Maintenance and technical support agreements are determined 3.5 Problem is referred to supervisor, management or technical area as required 3.6 Referrals are documented and tracked according to organization guidelines
4. Carry out maintenance	4.1 New components are obtained in line with organization guidelines 4.2 Maintenance is completed in line with organization guidelines 4.3 Used components are stored and disposed of in accordance with organization guidelines
5. Prepare Maintenance report	5.1 Maintenance is prepared in line with organization guidelines 5.2 Maintenance requirements to appropriate area are escalated as required

6. Confirm problem resolution	6.1 Client evaluation and feedback are obtained to ensure requirements of client are met 6.2 Problem is resolved to client satisfaction or client is referred to supervisor/appropriate person for follow- up 6.3 Problem is resolved to client satisfaction

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

Advice and support Can include

provision of client documentation, manuals; documentation from vendor. Advice on software supported by the organization can include but is not limited to: formatting spreadsheets, creation of graphs, setting up of work processing documents for printing, setting up an electronic mail system.

Advice on hardware supported by the organization can include but is not limited to: operation of printers, setting of screen resolution, formatting of disks, reconfiguration of printers and scanners.

Further investigation can include

on site examination; question and answers; active listening to client and other employees; contacting vendor or maintenance contract organizations; referring to technical area.

Database of known Problems

Can include information available in the workplace, from Internet or from software vendors.

Organization information

Includes security procedures, logged call procedures, contracting arrangements relating to Information Technology purchasing and hardware and software options within organizational environment.

Client user

May be a department within the organization or a third party and so the relation and ease of access will vary.

Documentation and reporting

Audit trails, naming standards, version control.

OH, and S Standards

As per company, statutory and vendor requirements. Ergonomic and environmental factors must be considered during the demonstration of this competency.

Organizational Standards

May be based upon formal, well-documented methodologies, or non-existent. For training delivery purposes, best practice examples from industry will be used.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects of evidence

Assessment must confirm the ability to record and prioritize client support activities, determining the required resources, solving the client problem or escalating according to organizational guidelines or practices.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Principles of EEO and anti-discrimination ✓ Principles of OH&S ✓ Broad general knowledge of OS and widely used application software ✓ Current industry accepted hardware and software products with broad knowledge of general features and capabilities and detailed knowledge in some areas ✓ Information Technology terminology ✓ Work group procedures Broad general knowledge of Equal Opportunity legislation ✓ In-house or vendor support available Security and network guidelines/procedures	✓ Strong customer service ✓ Communication skills ✓ Decision-making involving discretion and judgement ✓ Time management for self and Others ✓ Solving known problems in a variety of contexts ✓ Questioning and active listening for conveying and clarifying information ✓ Literacy skills in regard to interpretation of technical manuals

UNIT TITLE	Install and configure other IT related electronic devices				
DESCRIPTOR	This unit expressed the competency required to identify, install, manage and maintain different electronic devices required by the organization.				
CODE	ICTS01CR08V2/20	LEVEL	III	CREDIT	04

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Plane and prepare for installation	1.1 Specification of the device is identified according to the organization's rules and regulations. 1.2 All the necessary accessories required for the installation is identified. 1.3 Appropriate personnel are consulted to ensure that the work is effectively coordinated.
2. Installing the device	2.1 Best practice has been followed throughout the installation process 2.2 Minimal interruption to the ongoing service is assured 2.3 Disposal of old device/leftovers according to organizations guideline
3. Configuring electronic devices	3.1 Organizations requirements from the device has been identified. 3.2 Required Security measurements are applied.
4. Use of help	4.1 Help is accessed through on-line help and manuals 4.2 Internal organization client documentation is obtained and used. 4.3 Appropriate personnel are consulted.

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

Other IT devices can include

Door lock system, Security camera, PABX system, Biometric systems, Tablets, Drawing Pads etc.

Client user

May be a department within the organization or a third party and so the relation and ease of access will vary.

Documentation and reporting

Audit trails, naming standards, version control.

OH, and S Standards

As per company, statutory and vendor requirements. Ergonomic and environmental factors

must be considered during the demonstration of this competency.

Organizational Standards

May be based upon formal, well-documented methodologies, or non-existent. For training delivery purposes, best practice examples from industry will be used.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects of evidence

Assessment must confirm the ability of the candidate in adapting to new devices used. It also must confirm the effectiveness of the candidate and appropriate use of OH&S measurements regarding personal, environmental and equipment aspect.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Broad general knowledge of different equipment and its functions and basic features ✓ Current industry accepted hardware and software products with broad knowledge of general features and capabilities and detailed knowledge in some areas ✓ Hardware and software supported by the organization ✓ Information Technology terminology ✓ Work group procedures Broad general knowledge of Equal Opportunity legislation ✓ Broad general knowledge of Anti-discrimination legislation ✓ In-house or vendor support available Security and network guidelines/procedures ✓ Broad general knowledge of Occupational Health and Safety regulations	✓ Work with variety of devices ✓ Adaptability to new situations ✓ Decision-making involving discretion and judgement ✓ Time management for self and Others Solving known problems in a variety of contexts ✓ Questioning and active listening for conveying and clarifying information

UNIT TITLE	Create and Manage Technical Documentation				
DESCRIPTOR	This unit defines the competency required to create and manage technical documentation for various purposes in the field.				
CODE	ICTS01CR08V2/20	**LEVEL**	III	**CREDIT**	02

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Plan and prepare for documentation	1.1 Identify the areas documentations are needed. 1.2 Identify the data need for documentation 1.3 Identify a proper structure for documentation 1.4 Identify a proper application/platform for documentation in line with organization guideline
2. Developing and managing documentation	2.1 A format is determined for the documentation in line with organizations guide lines 2.2 A standard template is developed 2.3 Safety and integrity of technical documents are ensured 2.4 Technical documentation is accessed and disseminated as required to meet client requirements
3. Maintaining technical documentation	3.1 Technical documentation is stored as required by organizational guidelines 3.2 Technical documents are kept up to date

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

Technical Document can include

SOPs, Memos, graphics, letters, fliers, reports, newsletters, presentations, web pages, brochures, proposals, instructions, reviews, press releases, catalogs, advertisements, handbooks, business plans, policies and procedures, specifications, instructions, style guides, agendas and so forth.

Documentation and reporting

Audit trails, naming standards, version control.

OH, and S Standards

As per company, statutory and vendor requirements. Ergonomic and environmental factors must be considered during the demonstration of this competency.

Organizational Standards

May be based upon formal, well-documented methodologies, or non-existent. For training

delivery purposes, best practice examples from industry will be used.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects of evidence

Assessment must confirm the ability to prepare technical documentation of an event or job complete. Likewise, Proper record keeping and record maintaining should be demonstrated from the assessment.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Basic understanding of systems, organizational ✓ Basic software licensing requirements understanding ✓ General copyright regulations ✓ Broad knowledge of inventory principles and procedures ✓ Current business practices in relation to preparing reports	✓ Basic reading, writing and interpretation skills in regard to workplace documentation ✓ Plain Dhivehi and English literacy and communication skills in relation to the presentation of information ✓ Problem-solving skills for a defined range of predictable problems ✓ Low level decision-making skills

UNIT TITLE	Maintain equipment / Software inventory				
DESCRIPTOR	This unit defines the competency required to record and store the organization's software, equipment and technical documentation.				
CODE	ICTS01CR10V2/20	LEVEL	III	CREDIT	01

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1- Designing and identifying an appropriate platform	1.1 A platform (online/offline/manual) is selected according to organizational guidelines. 1.2 Equipment/software inventory is well designed 1.3 Access to inventory is disseminated as required by the organization.
2- Document and update inventory	2.1 Inventory is maintained to include Information Technology equipment movements, new purchases or redundant equipment 2.2 Software inventory and licenses are maintained and updated in line with upgrades 2.3 Manuals and associated technical documentation are recorded and stored 2.4 Unused equipment is stored according to technical manuals

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

Equipment

Variables may include but are not limited to: personal computers, networked systems, personal organizers, communications equipment. Peripherals may include printers, scanners, tape cartridges, speakers, multi-media kits. Keyboard equipment may include mouse, touch pad keyboard, pens.

Software

Variables may include but are not limited to: commercial software applications; organizational specific software; word processing, spreadsheet, database, graphic, mail, Internet browsers and presentation functionalities.

Organization

Variables may include but are not limited to: security procedures; storage and retrieval of product licenses; storage of Information Technology equipment and documentation; disposal policy; technical manuals, in-house, product and vendors.

Literacy

Literacy in regard to technical documentation.

Client user

May be a department within the organization or a third party and so the relation and ease of access will vary.

Documentation and Reporting

Audit trails, naming standards, version control.

OH&S Standards

As per company, statutory and vendor requirements. Ergonomic and environmental factors must be considered during the demonstration of this competency.

Organizational Standards

May be based upon formal, well-documented methodologies, or non-existent. For training delivery purposes, best practice examples from industry will be used.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects of evidence

Assessment must confirm the ability to accurately and regularly update and maintain the software, equipment and technical documentation inventory according to identified storage and retrieval policy and procedures. Software licensing requirements are adhered to according to vendor specifications; Inventories are regularly accessed and kept up to date; Literacy skills in regard to workplace documentation and technical manuals are demonstrated.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Basic understanding of systems, organizational ✓ Basic software licensing requirements understanding ✓ General copyright regulations ✓ Broad knowledge of inventory principles and procedures ✓ Current business practices in relation to preparing reports	✓ Basic reading, writing and interpretation skills in regard to workplace documentation ✓ Plain Dhivehi and English literacy and communication skills in relation to the presentation of information ✓ Problem-solving skills for a defined range of predictable problems ✓ Low level decision-making skills

UNIT TITLE	Maintain System Integrity				
DESCRIPTOR	This unit expresses the competency required to protect and secure organizations data locally.				
CODE	ICTS01CR11V2/20	LEVEL	III	CREDIT	03

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Carry out file maintenance	1.1 File back-ups are carried out 1.2 Back-ups are determined and stored according to organizational guidelines 1.3 Records or back-up are maintained
2. Carry out virus scanning	2.1 Virus protection is maintained 2.2 Detected viruses are reported to supervisor and are removed
3. Follow software copyright procedures	3.1 Software licenses are monitored 3.2 Illegal software is determined 3.3 Illegal software is reported to supervisor
4. Record software licenses	4.1 Licensed software is determined 4.2 Records of license number and location are maintained 4.3 Personal computers and networks are checked for illegal software 4.4 Illegal software is reported to supervisor
5. Restore system back-up	5.1 Back-ups are restored 5.2 Restore procedures are determined according to the organizational guidelines 5.3 Restore is carried out under supervisor instruction 5.4 Restore carried out is recorded according to the organizational guidelines
6. Install, configure and restore data from NAS	6.1 NAS is obtained and configured according to organizational guidelines 6.2 Data backups are taken to NAS in line with organizations guidelines 6.3 Restore is carried out under supervisor instruction 6.4 Restore carried out is recorded according to the organizational guidelines

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

Software

Operating Systems and Software applications with system security functions.

Hardware

May include but is not limited to: Desktops, Laptops, Mobile devices, NAS, Cables, Wireless devices etc.

Organization

Variables may include, but are not limited to: security procedures; backing-up procedures; virus removal procedures; software license documentation; reporting of illegal software; restore procedures.

Literacy skills

In regard to reporting and recording organizational documentation.

Client user

May be a department within the organization or a third party. Consequently, the relationship and ease of access will vary.

Documentation and Reporting

Audit trails, naming standards, version control.

Organizational Standards

May be based upon formal, well documented methodologies or non-existent. For training delivery purposes, best practice examples from industry will be used.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects for Assessment

Assessment must confirm the ability to protect and secure stand-alone operating systems according to system maintenance procedures. Undertaking file back-up, restore, delete and archive are carried out according to back-up and restore procedures.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Software copyright responsibilities ✓ A broad knowledge base incorporating some theoretical concepts of system performance and OS ✓ A broad knowledge base incorporating some theoretical concepts of restore procedures ✓ A broad knowledge base of storage and retrieval guidelines ✓ A broad knowledge base of current viruses and protection methods ✓ Broad knowledge of maintenance procedures ✓ A broad knowledge base of inventory procedures ✓ Current industry accepted hardware and software products with broad knowledge of general feature and capabilities and detailed knowledge in some areas ✓ A broad knowledge base incorporating some theoretical concepts of diagnostic tools	✓ Plain English literacy and communication skills in relation to the presentation of information Basic diagnostic skills in relation to system integrity ✓ Questioning and active listening in regard to clarifying instructions ✓ Basic analytical skills in relation to system integrity ✓ Problem-solving skills for a defined range of predictable problems ✓ Problem solving in regard to known problems in routine procedures ✓ Research skills for identifying broad features of current viruses and best practice in virus protection

UNIT TITLE	Basic Computer Network configuration				
DESCRIPTOR	This unit covers the knowledge, skills and attitudes needed to apply basic network configuration to a small LAN environment.				
Code	ICTS01CR12V2/20	**LEVEL**	III	**CREDIT**	03

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Introduction to computer numbering system	1.1 Main number systems and their functions are identified 1.2 Conversion between one numbering system to another is attained 1.3 Application of each numbering system is identified
2. Introduction to IPv4 and MAC address	2.1 The function and main structure of IPv4 is identified 2.2 IP classes its use is identified 2.3 The function of Subnet mask, Default Gateway, DNS and DHCP is identified 2.4 The function of MAC address and its main structure is identified
3. Configuring Network cable	4.3 Main types of network cables and its functions are identified 4.4 UTP/STP cable color codes for RJ45 and Keystone-jack RJ45 are identified 4.5 Punch wires into patch panel and Keystone-jack RJ45 is identified 4.6 Crimping network cable into RJ45 jack is identified 4.7 Point to point connectivity of the cable is ensured using network cable tester
4. Applying IPv4 to LAN devices	4.1 IP range need to be applied is identified 4.2 Connectivity between devices is checked
5. Basic Network commands used in Network	5.1 Basic network commands and its function used in computer network are identified

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

OH&S Standards

Occupational Health and Safety, Personal Safety, Workplace Hazards need to be considered

Hardware

Includes but not limited to: Desktop computers, Connectors, Adaptors, Wires and cables, appropriate software, Network standard racks / Network Switches, / patch panels for cable distribution etc.

Tools

Tools for: Cable Punching, Crimpers, Network Testers, Cable Identifiers, Wire Strippers, shaping, drilling, threading, tapping, finishing, dismantling, and assembling etc.

Literacy skills

In regard to reporting and recording organizational documentation.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

Critical aspects for Assessment

Assessment must show that the candidate is capable of manually distributing IP address to a small LAN environment along with successful ping commands.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
• Occupational health and safety measurements • Knowledge on Network tools and test equipment • Mathematical calculations • Wiring techniques • Understand Drawing interpretation • Knowledge on GUI/CLI interface	• Reading skills required to interpret work instructions • Communication skills needed to interpret and define work procedures • Problem solving in emergency situation • Configuration procedures • Cabling skills • Network cable wiring skills

UNIT TITLE	Install and configure Computer Networks				
DESCRIPTOR	This unit covers the knowledge, skills and attitudes needed to configure computer systems and networks.				
CODE	ICTS01CR13V2/20	Level	III	Credit	04

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Plan and prepare for install and configure the Network	1.1 Computer systems and networks to be configured are identified from the Job/Service Order or instructions 1.2 Configuration is planned and prepared in line with job requirements. 1.3 OH&S policies and procedures are followed in line with job requirements. 1.4 Computer systems and networks for configuration are checked against specifications and requirements. 1.5 Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements. 1.6 Tools, equipment and testing devices needed for configuration of computer systems and networks are obtained and checked for correct operation and safety
2. Network Installation	2.1 OH&S policies and procedures are followed 2.2 Devices/systems are installed in accordance with requirements, without damage or distortion to the surrounding environment or services 2.3 Variation to devices / systems installation is carried out in accordance to customer/client requirements 2.4 Devices / systems are terminated and connected in accordance with requirements 2.5 Unplanned events or conditions are responded to in accordance with established procedures 2.6 Approval is obtained in accordance with established procedures from appropriate personnel before any contingencies are implemented 2.7 On-going checks of the quality of the work are undertaken in accordance with established procedures

3. Configure Computer Systems and Networks	3.1 Appropriate personal protective equipment is used and OHS policies and procedures are followed 3.2 Computer systems and networks are configured in line with the standard operating procedures. 3.3 Normal function of systems and networks is checked in accordance with manufacturer's instructions 3.4 Fault or problem in the computer systems and networks is diagnosed in line with the standard operating procedures. 3.5 Unplanned events or conditions are responded to in accordance with established procedures
4. Inspect and Test Configured Computer Systems and Networks	4.1 Final inspections are undertaken to ensure that the configuration done on the systems and networks conforms with the manufacturer's instruction/manual 4.2 Computer systems and networks are checked to ensure safe operation. 4.3 Report is prepared according to company requirements.

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

OH&S Standards

Occupational Health and Safety Laws Personal Safety, Workplace Hazards and Environment Laws

Hardware

Includes but not limited to: Servers, peripherals, and desktop computers, Connectors, Adaptors, Wires and cables, appropriate software, Computer storage media, Network standard racks / Server racks / cabinets / Network Switches, / Routers / patch panels for cable distribution etc.

Tools

Tools for: Cable Punching, Crimpers, Network Testers, Cable Identifiers, Wire Strippers, shaping, drilling, threading, tapping, finishing, dismantling, and assembling etc.

Testing Devices

Testing devices includes but not limited to:

Multimeter, Calibrators, Signal generator, Oscilloscope, Optical Power Meters / Scopes / OTDRs etc.

Literacy skills

In regard to reporting and recording organizational documentation.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects for Assessment

Assessment must show that the candidate

- Interpreted work instructions according to job requirements.
- Diagnosed faults or problems on the systems and networks
- Configured the identified systems and networks
- Checked configured systems and networks to ensure safety
- Documented the tasks undertaken

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Occupational health and safety ✓ Use of tools Network tools ✓ Mathematical calculations ✓ Use of test equipment and calibrators ✓ Wiring techniques ✓ Drawing interpretation ✓ Soldering techniques ✓ Computer operations	✓ Reading skills required to interpret work instructions ✓ Communication skills needed to interpret and define work procedures ✓ Problem solving in emergency situation ✓ Configuration procedures

UNIT TITLE	Configure, Manage and Test Network Security				
DESCRIPTOR	This unit covers the knowledge, skills and attitudes needed to secure and diagnose computer systems and networks.				
CODE	ICTS01CR14V2/20	**LEVEL**	III	**CREDIT**	03

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Identify threats and areas that need more security in the Network.	1.1 Diagnosis of potential threats to the network are identified according to requirements and in line with the standard procedures. 1.2 Tools, equipment and testing devices needed to carry out the work are obtained in accordance with established procedures and checked for proper operation and safety. 1.3 Appropriate personnel are consulted to ensure that the work is effectively coordinated.
2. Implement Network Security	2.1 Equipment/applications necessary to complete the work are obtained in accordance with established procedures and checked against job requirements 2.2 Security measurements are implemented in line with policies and procedures of the organization. 2.3 Appropriate personnel are consulted to ensure that the work is effectively coordinated. 2.4 Unplanned events or conditions are responded to in accordance with established procedures
3. Rectify/correct defects in computer systems and networks	3.1 Appropriate personal protective equipment is used in line with standard procedures. 3.2 Defective components or parts are replaced or corrected without damage to the surrounding environment or services 3.3 Adjustments, if necessary are made in accordance with established procedures 3.4 Unplanned events or conditions are responded to in accordance with established procedures.

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

Hardware

Includes but not limited to: Servers, peripherals, and desktop computers, Network switch, routers, modems etc.

Testing Devices

Testing devices includes but not limited to: Multimeter, software, Maintenance bench and Power

supply equipment

Literacy skills

In regard to reporting and recording organizational documentation.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects for Assessment

Assessment must show that the candidate:

- Interpreted work instructions according to job requirements.
- Conducted maintenance properly on the systems using standard procedures
- Diagnosed faults in the systems
- Checked the maintained/serviced systems to ensure safety
- Documented the tasks undertaken.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Through knowledge of how network works. ✓ Knowledge of wide range of testing tools. ✓ Standard procedure of using help ✓ Broad knowledge on network threats and network security	✓ Problem solving in emergency situation ✓ Network Cabling ✓ Connecting computers to wired and wireless LAN ✓ Removing viruses from infected machines ✓ Pinpoint the exact problematic area in a LAN.

UNIT TITLE	Maintain Computer Systems and Networks				
DESCRIPTOR	This unit covers the knowledge, skills and attitudes needed to maintain computer systems and networks.				
CODE	ICTS01CR15V2/20	**LEVEL**	III	**CREDIT**	03

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Plan and prepare for maintenance	1.1 Maintenance is planned and prepared in line with job requirements. 1.2 OHS policies and procedures are followed in line with job requirements. 1.3 Computer systems and networks for maintenance are checked against specifications and requirements. 1.4 Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements. 1.5 Tools, equipment and testing devices needed for the maintenance are obtained and checked for correct operation and safety 1.6 Computer systems and networks maintained are identified from the job/service order or instructions
2. Maintain computer systems and networks	2.1 Appropriate personal protective equipment is used in line with standard procedures. 2.2 Normal function of computer systems and networks are checked in accordance with manufacturer's instructions. 2.3 Scheduled/periodic maintenance is performed in accordance with manufacturer's requirements. 2.4 Where necessary, needed repairs/replacements are made in accordance with established procedures. 2.5 Unplanned events or conditions are responded to in accordance with established procedures.
3. Inspect computer networks and the test systems	3.1 Final inspections are undertaken to ensure that the testing conducted on the device conforms with the manufacturer's instruction/manual 3.2 Computer systems and networks are checked periodically to ensure safe operation. 3.3 Work site is cleaned and cleared of all debris and left in safe condition in accordance with company procedures 3.4 Report is prepared and completed according to company requirements

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

OH&S Standards

Occupational Health and Safety Laws Personal Safety, Workplace Hazards and Environment Laws

Hardware

Includes but not limited to: Servers, peripherals, and desktop computers, disks & CDs

Tools

Tools for: cutting, shaping, drilling, threading, tapping, finishing, dismantling, and assembling.

Testing Devices

Testing devices includes but not limited to:

Multimeter, software, Maintenance bench and Power supply equipment

Literacy skills

In regard to reporting and recording organizational documentation.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects for Assessment

Assessment must show that the candidate:

- Interpreted work instructions according to job requirements.
- Conducted maintenance properly on the systems using standard procedures
- Diagnosed faults in the systems
- Checked the maintained/serviced systems to ensure safety
- Documented the tasks undertaken.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS

✓ Occupational health and safety ✓ PC systems ✓ Computer Operating Systems ✓ Use of tools ✓ Mathematical calculations ✓ Electrical theory ✓ Electronics theory ✓ Wiring techniques ✓ Drawing interpretation ✓ Computer operations ✓ Advanced networking ✓ Network cabling ✓ Viruses	✓ Use of applications software ✓ Reading skills required to interpret work instructions ✓ Communication skills needed to interpret and define work procedures ✓ Problem solving in emergency situation ✓ Network Cabling ✓ Connectingcomputers to wired and wireless LAN ✓ Removing viruses from infected machines

UNIT TITLE	**Diagnose and Troubleshoot Computer Networks**
DESCRIPTOR	This unit describes the skills and knowledge required to identify issues in networks and how to solve them properly.

CODE	ICTS01CR16V2/20	LEVEL	III	CREDIT	03

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Plan and prepare for diagnosis of faults of computer networks	1.1 Diagnosis of faults is planned and prepared in line with job requirements 1.2 OH & S policies and procedures are followed in line with job requirements 1.3 Appropriate personnel are consulted to ensure that the work is effectively coordinated 1.4 Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements 1.5 Tools, equipment and testing devices needed to carry out the work are obtained in accordance with established procedures and checked for proper operation and safety. 1.6 Computer systems and networks defects are checked against job requirements.
2. Diagnose faults of computer network	2.1 Appropriate personal protective equipment is used in line with standard procedures. 2.2 Faults or problems in the computer systems and networks are diagnosed according to requirements and in line with the standard procedures. 2.3 Contingency measures are managed and implemented in accordance with established procedures 2.4 Unplanned events or conditions are responded to in accordance with established procedures
3. Rectify/correct defects in computer systems and networks	3.1 Appropriate personal protective equipment is used in line with standard procedures. 3.2 Defective components or parts are replaced or corrected without damage to the surrounding environment or services 3.3 Adjustments, if necessary are made in accordance with established procedures 3.4 Unplanned events or conditions are responded to in accordance with established procedures.
4. Test systems and networks	4.1 Computer systems and networks are tested to ensure safe operation. 4.2 Unplanned events or conditions are responded to in accordance with established procedures. 4.3 Report/s are prepared and completed according to company policy

RANGE STATEMENT

Technological Upgrades/Changes

Should be focused on latest stable version/model of software/hardware available. And use of software and hardware should follow the general standard of software/hardware use.

OH&S Standards

Occupational Health and Safety Laws Personal Safety, Workplace Hazards and Environment Laws

Hardware

Includes but not limited to: Peripherals, desktop computers, Tablets, TVs, printers etc.

Tools

Tools for: cutting, shaping, drilling, threading, tapping, finishing, dismantling, and assembling.

Testing Devices

Testing devices includes but not limited to:

Multimeter, software, Maintenance bench and Power supply equipment

Literacy skills

In regard to reporting and recording organizational documentation.

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

Assessment may be done in workplace or a simulated work environment.

The assessor may select all of the following assessment methods to objectively assess the candidate: Observation, Questioning, Third Party Portfolio, written exam.

Critical aspects for Assessment

Assessment must show that the candidate:

- Interpreted work instructions according to job requirements.
- Conducted maintenance properly on the systems using standard procedures
- Diagnosed faults in the systems
- Checked the maintained/serviced systems to ensure safety
- Documented the tasks undertaken

Literacy skills

In regard to reporting and recording organizational documentation.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ OH&S policies and procedures ✓ PC systems ✓ Computer Operating Systems ✓ Use of tools ✓ Mathematical calculations ✓ Electrical and Electronic theory ✓ Wiring techniques ✓ Drawing interpretation ✓ Computer operations ✓ Advanced networking ✓ Network cabling ✓ Viruses	✓ Use of applications software ✓ Reading skills required to interpret work instructions ✓ Communication skills needed to interpret and define work procedures ✓ Problem solving in emergency situation ✓ Network Cabling Skills ✓ Connectingcomputers to wired and wireless LAN ✓ Removing viruses from infected machines