Technical and Vocational Education and Training Authority

National Competency Standard for Computer Hardware and Networking

Standard Code: ICTS01V2/20

Qualification Name: National Certificate IV in Computer Hardware and Networking
Qualification Code: ICTS01Q2L4V2/20

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 "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.
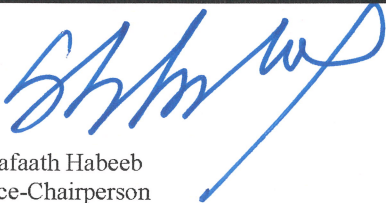

Mohamed Hashim
Minister of State for Higher Education
TVET Authority

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 Occupation"

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 IV in Computer Hardware and Networking"

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

1. *Computer Technician*
2. *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 a 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
Curricula	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 IV IN COMPUTER HARDWARE AND NETWORKING	
3. Qualification code: ICTS01Q2L4/20	**Total Number of Credits: 120**

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 IV 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+17

6. Schedule of Units:

Unit No.	Unit Title	Code
Common Competencies		
01	Leadership skills	ICTS01CR01V2/20
02	Programing skills for office automation	ICTS01CR02V2/20
03	Fundamentals of web development	ICTS01CR03V2/20
04	Creating a Website with CMS	ICTS01CR04V2/20
Core Competencies		
05	Install and configure open source OS	ICTS01CR05V2/20
06	Install and configure windows server	ICTS01CR06V2/20
07	Create and Manage small server environment	ICTS01CR07V2/20
08	Securing server environment	ICTS01CR08V2/20
09	Windows Server Backup	ICTS01CR09V2/20
10	Advanced Networking	ICTS01CR10V2/20
11	Network Security	ICTS01CR11V2/20
12	Configure router using CLI	ICTS01CR12V2/20
13	Implement and manage wireless networks	ICTS01CR13V2/20
14	Virtualization concepts	ICTS01CR14V2/20
15	Create and configure a local virtual system	ICTS01CR15V2/20
16	Cloud computing concepts	ICTS01CR16V2/20
17	Implement and configure cloud base service	ICTS01CR17V2/20
7.Accreditation Requirements	The training provider should place trainees in relevant industry or sector to provide the trainees the hands-on experience exposure related to this qualification.	
8. Recommended Sequencing of Units	As appearing under the section 06	

Unit Details

#	Unit Title	Code	Level	No of Credits
01	Leadership skills	ICTS01CR01V2/20	IV	05
02	Install and configure open source OS	ICTS01CR05V2/20	IV	05
03	Install and configure windows server	ICTS01CR06V2/20	IV	05
04	Create and Manage small server environment	ICTS01CR07V2/20	IV	15
05	Securing server environment	ICTS01CR08V2/20	IV	05
06	Windows Server Backup	ICTS01CR09V2/20	IV	07
07	Advanced Networking	ICTS01CR10V2/20	IV	05
08	Network Security	ICTS01CR11V2/20	IV	10
09	Configure router using CLI	ICTS01CR12V2/20	IV	08
10	Implement and manage wireless networks	ICTS01CR13V2/20	IV	05
11	Virtualization concepts	ICTS01CR14V2/20	IV	05
12	Create and configure a local virtual system	ICTS01CR15V2/20	IV	07
13	Cloud computing concepts	ICTS01CR16V2/20	IV	05
14	Implement and configure cloud base service	ICTS01CR17V2/20	IV	07
15	Programing skills for office automation	ICTS01CR02V2/20	IV	10
16	Fundamentals of web development	ICTS01CR03V2/20	IV	09
17	Creating a Website with CMS	ICTS01CR04V2/20	IV	07

Packaging of National Qualifications:

National Certificate IV 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+17

Qualification Code: ICTS01Q2L4/20

UNIT TITLE	**Leadership Skills in an ICT environment**				
DESCRIPTOR	This unit defines the competency required to manage, organize a small team effectively in an information technology environment.				
CODE	ICTS01CR01V2/20	**LEVEL**	IV	**CREDIT**	05

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Develop a Vision, Policy and a Plan	1.1 Vision is created based on the task given 1.2 A plan to achieve the vision is created 1.3 Policies to follow the created plan is identified
2 Staff Management	2.1 Staffs are motivated and work as a team to achieve the goal 2.1 Staffs concerns are accepted and worked towards a solution
3 Time Management	3.1 Task given has accomplished according to client's guidelines in a timely manner 3.2 Encouraged and direct co-workers to finish the task on time
4 Organization development	4.1 By giving Organization's development a higher priority, staffs work towards organization's success 4.2 Areas that need improvement in the organization is identified and discussed with higher management 4.3 Plans to improve the organization are created and discussed with higher management

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.

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.

Organizational

Size and type of organization and organizational values and culture may vary.

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, 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

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. Also, the candidate must show leadership and responsibility in different situations.

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 ✓ Broad knowledge on human behavior and factors affecting it ✓ Broad knowledge on leadership styles	✓ 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 ✓ Most appropriate solution is determined and applied for a given issue. ✓ Decision-making involving discretion and judgement ✓ Time management for self and Others

UNIT TITLE	Install and configure Open Source OS				
DESCRIPTOR	This unit defines the competency required to install an open source operating system to a computer system, and configure it according to organizations requirements.				
CODE	ICTS01CR05V2/20	**LEVEL**	IV	**CREDIT**	05

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Identify an appropriate opensource OS	1.1 Organization, user and system requirements are identified 1.2 Availability and compatible application software are identified 1.3 Stability and reliability of the OS is ensured
2. Installing opensource OS	2.1 Process is undertaken so clients experience minimal disruption 2.2 Computer is installed to accept software 2.3 Testing and acceptance in line with corporate guidelines are carried out 2.4 Client requirements are satisfied. 2.5 Amendments are made as required for client, or client is referred to appropriate person/ supervisor, if necessary
3. Configure OS and install application software	3.1 OS is configured according to organizations requirements, including but not limited to, user creation, Network configuration and firewall configuration 3.2 Required application software are obtained and installed.

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

Variables may include, but are not limited to: commercial software applications; organizational specific software; operating systems – standalone PC systems and network operating systems; word processing, spreadsheet, database, graphics, communications packages or any applications as used by the organization; software installation instructions and manuals; range of suppliers.

Hardware

Include Operating Systems, Drivers, Applications used for personal purposes such as Microsoft Office Package, Diagnostic tools, Graphic Applications, Various game applications etc.

Organization

Variables may include but are not limited to: contacting arrangements relating to Information Technology purchasing; licensing requirements and supplier options; storage and retrieval of product licenses; storage of Information Technology equipment and documentation; testing standards. Client requirements may vary.

Client user

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

Development methods/tools

Will vary from the traditional Systems Development life cycle with little or no formalization to a very well-structured CASE tool.

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

Tools, equipment and materials required may include:

Nil

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 install software applications through operating system instructions and to configure computer to accept new software or upgrade.

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 obtaining/purchasing a product ✓ 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	✓ 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

UNIT TITLE	Install and Configure Windows Server				
DESCRIPTOR	This unit defines the competency required to install windows server to machine and create a domain with basic configuration.				
CODE	ICTS01CR06V2/20	**LEVEL**	IV	**CREDIT**	05

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Plan and prepare for installation	1.1 Organizations requirements are acted on in line with organization guidelines, corporate purchasing, licensing arrangements, and budget 1.2 Licensing requirements are determined and recorded in line with organization guidelines
2. Obtain Windows Server	2.1 Windows Server is obtained according to organizations requirements 2.2 Licensing requirements are determined and recorded in line with organization guidelines
3. Windows Server Installation	3.1 Installation/Upgrades are installed to meet Organizations requirements 3.2 Process is undertaken so clients experience minimal disruption 3.3 Testing in line with corporate guidelines are carried out 3.3 Organization requirements are satisfied.
4. Make essential settings	4.1 Domain Controller is setup according to organizations guidelines 4.2 DHCP is configured to distribute IP address to client devices 4.3 File sharing and file access is configured according to organizations requirements 4.4 Testing in line with corporate guidelines are carried out 4.5 Client requirements are satisfied 4.6 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

Latest stable release of Windows Server or the stable version prior to the latest stable version.

Hardware

Desktop computers, Physical Servers, Cloud services

Organization

Variables may include, but are not limited to: contacting arrangements relating to Information Technology purchasing; licensing requirements and supplier options; storage and retrieval of product licenses; storage of Information Technology equipment and documentation; testing standards. Client requirements may vary.

Client user

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

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.

Tools, equipment and materials required may include:

Nil

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 install software applications through operating system instructions and to configure computer to accept new software or upgrade.

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 obtaining/purchasing a product ✓ 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 server hardware storage ✓ Broad general knowledge of cloud services ✓ Broad general knowledge of the client business domain	✓ 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 ✓ Installing and Managing Windows Server ✓ Configure Windows Server

UNIT TITLE	**Create and Manage a Small Server Environment**				
DESCRIPTOR	This unit defines the competency required to create a small domain and to manage different devices within the domain.				
CODE	ICTS01CR07V2/20	**LEVEL**	IV	**CREDIT**	15

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Plan and prepare for domain creation process	1.1 Organizational requirements have been reviewed 1.2 Essential updates are installed 1.3 Essentials services are determined 1.4 Organization's Network configuration is reviewed and planned 1.5 Organizational Units and Sub Organizational units are determined
2. Create Windows domain controller with essential services	2.1 Domain controller is created 2.2 Essential services are installed and configured in line with organizations guidelines 2.3 Pre-planned Network configuration is applied
3. Adding devices to Windows Domain	3.1 Windows based devices are added to domain 3.2 Linux based devices are added to domain
4. Add users to domain with appropriate permissions	4.1 User profile are created according to the pre-planned document 4.2 Folder structure is created according to organizations guideline 4.3 Folder permissions are created according to organizations guidelines and international best practice 4.4 Users are bind to their respective folder
5. Testing	5.1 Testing in line with corporate guidelines are carried out 5.2 Client requirements are satisfied. 5.3 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.

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

Testing Devices

Diagnostic application

Literacy skills

In regard to reporting and recording organizational documentation.

Interdependent assessment of units:

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

ASSESSMENT GUIDE

Form of Assessment

Continuous assessments together with collected evidence of performance will be used 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.
- Successfully configured different services on Windows Server
- Enabled Clients to work in a Server environment without any issue
- Ensured domain users with wired/wireless devices have access to server and services
- Ensured domain users that use other OS have access to server and services

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Occupational health and safety procedures ✓ Use of Network diagnostic tools ✓ Organizational guidelines for creating domain environment ✓ Drawing interpretation ✓ Computer operations ✓ Broad knowledge on Windows Server services ✓ Broad knowledge on networking components	✓ Reading skills required to interpret work instructions ✓ Communication skills needed to interpret and define work procedures ✓ Problem solving skills ✓ Server Configuration procedures ✓ Connecting between wired and wireless devices ✓ Different operating system Configuration skills

UNIT TITLE	Securing Server Environment				
DESCRIPTOR	This unit defines the competency required to secure a domain environment from unauthorized access to files and folders as well as to network.				
CODE	ICTS01CR08V2/20	**LEVEL**	IV	**CREDIT**	05

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Configure Windows Server Firewall and Antivirus	1.1 Windows Firewall is configured to filter untrusted network traffic 1.2 Windows Antivirus is configured to auto update 1.3 Minimal apps are allowed in Windows Server
2. Setup user account policies	2.1 Domain user policy is setup according to organizations guideline 2.2 Application Security is implemented using Group policy 2.3 Desktop environment is configured using Group policy
3. Manage access to Windows server	3.1 Secure Remote Desktop access is configured 3.2 Firewall is configured to limit access to server 3.3 Just Enough Administration (JEA) concept is Deployed

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, Desktop computers, Network switch, routers, modems etc.

Software

Latest stable release of Windows Server or the version prior to the latest stable version, Windows 10, Linux distributions etc.

Literacy skills

In regard to reporting and recording organizational documentation.

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.

Interdependent assessment of units:

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

ASSESSMENT GUIDE

Form of Assessment

Continuous assessments together with collected evidence of performance will be used 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
✓ Through knowledge of how network works	✓ Problem solving in emergency situation
✓ Standard procedure of using help	✓ Removing viruses from infected machines
✓ Organizational requirements for domain/network security	✓ Ability to follow Server backup and restore procedures
✓ Broad knowledge on security threats	✓ Appropriate implementation of domain user policies
✓ Broad knowledge on network security	✓ Appropriate implementation of server firewall
✓ Broad knowledge on server user policies	
✓ Broad knowledge on firewall	

UNIT TITLE	Windows Server Backup				
DESCRIPTOR	This unit defines the competency required to protect organization's data by creating and securing server backup.				
CODE	ICTS01CR09V2/20	**LEVEL**	IV	**CREDIT**	07

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Prepare a Backup and restore plan	1.1 All the required equipment is identified 1.2 A backup plan in line with organizations policies and regulations is established 1.3 A backup procedure in line with organizations policies and regulations is determined
2. Backing-up Windows Server	2.1 Install Windows Backup Service is installed 2.2 Data on server are backed-up according to organization's requirements 2.3 Windows server backup is schedule according to organizations requirements
3. Securing Windows Server Backup	3.1 BitLocker feature is enabled 3.2 Server backup is encrypted using BitLocker 3.3 Server backup is taken to Network Attached Storage 3.4 A copy of server backup is stored in a different location
4. Configure RAID	4.1 Appropriate Raid configuration is determined 4.2 Hardware and software required for RAID setup is obtained 4.3 RAID is configured according to organizational requirement
5. Config SAN	5.1 Plan and prepare for SAN installation 5.2 Hardware requirements are obtained according to organizations guidelines 5.3 SAN is configured to take backup in line with organizations guidelines 5.4 Data from SAN is restored upon request

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

Variables may include, but are not limited to: personal computers, networked systems, tools to

perform back-ups such as tapes, streamers, floppy disks

Software

Software application/operating system with system security functions.

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.

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.

Tools, equipment and materials required may include:

Nil

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

- Backed up organizations data successfully
- Configured RAID
- Backed up organizations data to SAN

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Broad knowledge on different backup plans ✓ 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 ✓ 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 ✓ Data backup and restoration skills

Unit Title	Configure and Maintaining Router Using CLI				
Descriptor	This unit expressed the competency required to access, configure and manage routers through CLI.				
Code		Level	IV	Credit	5

Element of competencies	Performance Criteria
1. Accessing router	1.1 Router is accessed locally and remotely 1.2 Router is accessed through SSH
2. Configuring router	2.1 Username and password are configured to router 2.2 Basic configuration is applied 2.3 IP address is assigned to router 2.4 Router interfaces are configured to functional level.
3. Maintaining Router	3.1 Router configurations are verified 3.2 Router Logs are checked

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: Cisco routers, Juniper Routers, 3COM Routers etc.

Software

Router simulations

Literacy skills

In regard to reporting and recording organizational documentation.

Interdependent assessment of units:

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

ASSESSMENT GUIDE

Form of assessment

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

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

Assessment context

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

Critical aspects for Assessment

Assessment must show that the candidate:

- Interpreted work instructions according to job requirements
- Configured router to perform basic functions
- Configured secure access to router
- Read the router configuration file and identified the essential information
- Documented the tasks undertaken

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Through knowledge of how network works	✓ Problem solving skills
✓ Broad knowledge on various router types	✓ Apply basic configuration to
✓ Knowledge of wide range of testing tools	✓ Reading skills required to interpret work instructions
✓ Broad knowledge of configuration difference in various routers	✓ Communication skills needed to interpret and define work procedures
✓ Standard procedure of using help	

UNIT TITLE	Advanced Networking					
DESCRIPTOR	This unit defines the competency required to protect organization's data by creating and securing server backup.					
CODE	ICTS01CR10V2/20	**LEVEL**	IV	**CREDIT**	10

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. OSI Model	1.1. Data transmission through each layer of OSI model is clearly understood 1.2. Applications and devices of each layer is explained
2. IPv4 and IPv6	2.1. Emergence and use of IPv6 is explained 2.2. Segments of IPv6 is identified 2.3. Subnetting in IPv4 and IPv6 2.4. Connection between two devices is established using subnetting
3. Routing protocols	3.1. Identified suitable routing protocol for a given situation 3.2. Configured static routing according to the network IP addresses
4. Subnetting	4.1. Structure of the organization is identified 4.2. IP class/classes is selected according to the network structure 4.3. Subnetted IP addresses are applied to network devices 4.4. Testing and acceptance in line with corporate guidelines are carried out

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, Desktop computers, Laptops, Mobile devices etc.

Literacy skills

In regard to reporting and recording organizational documentation.

Tools, equipment and materials required may include:

Nil

ASSESSMENT GUIDE

Form of Assessment

Continuous assessments together with collected evidence of performance will be used 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
- Identified the basic functions of OSI Model layers
- Diagnosed faults or problems on the systems and networks
- Applied IPv4 and IPv6 to devices
- Checked systems and networks to ensure connectivity
- Applied routing to communicate between devices in two different networks
- Documented the tasks undertaken

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Mathematical calculations ✓ Knowledge on how IP address works ✓ Knowledge on appropriate use of IPs ✓ Knowledge on how data transfer from device to device ✓ Knowledge on routing protocols ✓ Knowledge on how subnetting works	✓ Reading skills required to interpret work instructions ✓ Communication skills needed to interpret and define work procedures ✓ Problem solving in emergency situation ✓ Configuration procedures ✓ Routing configuration skills ✓ Subnetting skills

UNIT TITLE	NETWORK SECURITY				
DESCRIPTOR	This unit defines the competency required to secure networks against internal and external threats.				
CODE	ICTS01CR11V2/20	**Level**	IV	**Credit**	08

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Plan and prepare for security implementation	1.1 Security measurements need to take on organization network is discussed with higher authorities 1.2 Security measurements are planned and recorded 1.3 Tools and devices needed to implement security is identified
2. Obtain software / Hardware	2.1 Software is obtained under instruction from management or supervisor 2.2 Licensing requirements are determined and recorded in line with organization guidelines
3. Implementing security	3.1 Access to Router is secured 3.2 Router firewall is enabled to allow essential data 3.3 Data traffic is managed using ACLs 3.4 Virtual boundaries are created using VLANs
4. Confirm problem resolution	4.1 Client evaluation and feedback are obtained to ensure requirements of client are met 4.2 Problem is resolved to client satisfaction or client is referred to supervisor/appropriate person for follow- up 4.3 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.

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: Network Tester, Cable Identifier etc.

Literacy skills

In regard to reporting and recording organizational documentation.

Tools, equipment and materials required may include:

Nil

ASSESSMENT GUIDE

Form of Assessment

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

Literacy skills

In regard to reporting and recording organizational documentation.

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

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
✓ Broad knowledge of organizations requirements on network security. ✓ Communication Skills ✓ Knowledge of wide range of testing tools. ✓ Standard procedure of implementing network security ✓ Broad knowledge on security threats ✓ Knowledge of Security Across Various Platforms ✓ Broad knowledge on ACL and VLAN	✓ Problem solving skills according to the current situation ✓ Fundamental Computer Forensics Skills ✓ Proper application of ACL ✓ Proper application of VLANs

UNIT TITLE	**Implement and Manage Wireless Networks**				
DESCRIPTOR	This unit defines the competency required to provide wireless connection to clients and to manage the wireless networks.				
CODE	ICTS01CR13V2/20	**Level**	IV	**Credit**	07

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Determine wireless requirements of the organization	1.1 Wireless requirements of the organization are identified 1.2 Procedure of the task is planned and organized 1.3 Hardware required for the task is identified
2. Obtain hardware	2.1 Required hardware is obtained under instruction from management 2.2 Licensing requirements are determined and recorded in line with organization guidelines
3. Implement wireless hardware	3.1 Process is undertaken so clients experience minimal disruption 3.2 Assured absence of any obstacle that interfere the signal between point to point wireless nodes 3.3 Testing and acceptance in line with corporate guidelines are carried out 3.4 Client requirements are achieved.
4. Make essential settings	1.1. Essentials amendments are made according to organizations 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.

Hardware

Can include, but is not limited to: Indoor/outdoor wireless devices, Long range point to point wireless devices etc.

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&S Standards

Safety of own self, surrounding environment and equipment is considered.

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.

Tools, equipment and materials required may include:

Nil

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 show that the candidate:

- Interpreted work instructions according to job requirements
- Understand the wireless networking concepts
- Configured long range point to point wireless devices
- Configured wireless network with multiple access points

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
✓ Broad general knowledge of different wireless equipment and it's functions and basic features ✓ Broad knowledge on how wireless network works ✓ 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 ✓ Occupational Health and Safety regulations	✓ Work with variety of devices ✓ Providing the best possible solution with the budget and equipment provided ✓ 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	Virtualization Concepts				
DESCRIPTOR	This unit covers the knowledge and attitudes needed to apply virtualization concept to the organization				
CODE	ICTS01CR14V2/20	**LEVEL**	IV	**CREDIT**	05

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Understanding virtualization concepts and terminologies	1.1. Benefits of virtualization is explained 1.2. Distinguished the functional difference between Main types of virtualization 1.3. Recommended a suitable virtualization type for the organization

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, Desktop Computers, cloud services etc.

Literacy skills

In regard to reporting and recording organizational documentation.

Tools, equipment and materials required may include:

Nil

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be used 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
- Understands virtualization concepts
- Knows how to apply virtualization to an organization
- Can recommend virtualization setup for a small to medium business

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 policies and procedures ✓ Broad knowledge on how virtualization works ✓ Broad knowledge on advantages and disadvantages of virtualization ✓ Broad knowledge on appropriate application of virtualization	✓ Use of application software ✓ Reading skills required to interpret work instructions ✓ Communication skills needed to interpret and define work procedures ✓ Problem solving in emergency situation

UNIT TITLE	**Create and configure a Local Virtual System**					
DESCRIPTOR	This unit covers the outcomes required in installing, managing and maintaining a local virtual system					
CODE	ICTS01CR15V2/20	**LEVEL**	IV	**CREDIT**		07

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Plan and prepare for implementing virtualization	1.1 Installation is planned and prepared to ensure OH&S policies and procedures are followed, the work is appropriately sequenced in accordance with requirements 1.2 Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved on the work
2. Obtain virtualization application	2.1 Virtualization application is obtained according to organizations requirement 2.2 Licensing requirements are determined and recorded in line with organization guidelines
3. Install and configure virtualizing Application	3.1 Virtualization application is installed according to organizations requirement 3.2 Process is undertaken so clients experience minimal disruption 3.3 Unplanned events or conditions are responded to in accordance with established procedures
4. Conduct test	4.1 Testing and acceptance in line with corporate guidelines are carried out 4.2 Client requirements are satisfied. 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.

Hardware

Includes but not limited to: Servers, Desktop Computers, Network switch, Routers, Cloud, Cloud Services etc.

Software

Includes but not limited to: Server OS, Hypervisor etc.

Literacy skills

In regard to reporting and recording organizational documentation.

Tools, equipment and materials required may include:

Nil

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be used 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
- Successfully installs hypervisor to local server/system
- Successfully run two server instances simultaneously
- Documented the tasks undertaken.

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
✓ Through knowledge of how network works. ✓ Knowledge of wide range of virtualization	✓ Problem solving skills ✓ Working with different OS platforms ✓ Reading skills required to interpret work

platforms ✓ Standard procedure of using help ✓ Knowledge on hardware requirement for virtualization	instructions ✓ Communication skills needed to interpret and define work procedures

UNIT TITLE	**Cloud Computing Concepts**				
DESCRIPTOR	This unit covers the knowledge and attitudes needed to implement cloud computing service at organization				
CODE	ICTS01CR16V2/20	**LEVEL**	IV	**CREDIT**	05

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1 Understanding virtualization concepts and terminologies	1.1 Benefits of cloud computing is explained 1.2 Characteristics of cloud computing is illustrated 1.3 Cloud service models and types are explained 1.3 Recommended a suitable cloud computing for the organization

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, Desktop computers, Cloud Services etc.

Literacy skills

In regard to reporting and recording organizational documentation.

Tools, equipment and materials required may include:

Nil

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be used 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
- Documented the tasks undertaken

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
✓ Broad knowledge on how Cloud computing works ✓ Broad knowledge on different options and features available on cloud computing ✓ Broad knowledge on various platforms of cloud computing	✓ Problem solving skills ✓ Working with different OS platforms ✓ Reading skills required to interpret work instructions ✓ Communication skills needed to interpret and define work procedures

UNIT TITLE	**Implement and Configure Cloud-Based Services**					
DESCRIPTOR	This unit covers the outcomes required in installing, managing and maintaining a basic cloud system					
CODE	ICTS01CR17V2/20	**Level**	IV	**Credit**	07	

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1 Plan and prepare for implementing cloud computing service	1.1 Installation is planned and prepared to ensure OH&S policies and procedures are followed, the work is appropriately sequenced in accordance with requirements 1.2 Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved on the work
2 Obtain a cloud computing platform	2.1 Cloud computing platform is obtained according to organizations requirement 2.2 Licensing requirements are determined and recorded in line with organization guidelines
3 Configure cloud computing	3.1 Cloud computing is configured according to organizations requirement 3.2 Process is undertaken so clients experience minimal disruption 3.3 Unplanned events or conditions are responded to in accordance with established procedures
4 Conduct test	4.1 Testing and acceptance in line with corporate guidelines are carried out 4.2 Client requirements are satisfied. 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.

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.

Tools, equipment and materials required may include:

Nil

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be used 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.
- Implement a basic Could-based environment
- Documented the tasks undertaken.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Through knowledge of how network works. ✓ Knowledge of wide range of cloud computing platforms ✓ Standard procedure of using help ✓ Knowledge on hardware requirement for cloud computing	✓ Application of proper cloud computing concept for a given situation ✓ Problem solving skills ✓ Working with different OS platforms ✓ Reading skills required to interpret work instructions ✓ Communication skills needed to interpret and define work procedures

UNIT TITLE	**Programing Skills for Office Automation**					
DESCRIPTOR	This unit describes the skills and knowledge required to automate general tasks of a working environment to increase efficiency.					
CODE	ICTS01CR02V2/20	**LEVEL**	IV	**CREDIT**	10	

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1 Identify a task to automate	1.1 Task to be automated is identified 1.2 Automate application requirements are approved by management 1.3 A language to write the code is identified 1.4 Determine program life cycle 1.5 Determine the expected output of the program
2 Choosing a language to write code	2.1 Appropriate language to write code is obtained 2.2 Application is written to obtain organizational requirements
3 Testing the code	3.1 Written code is tested on testing environment 3.2 Necessary amendments are done to make the code function as intended 3.3 Unplanned events or conditions are responded to in accordance with established procedures. 3.4 Client requirements are satisfied. 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.

Hardware

Includes but not limited to: Servers, Desktop Computers, Network switch, Routers, Cloud Services etc.

Literacy skills

In regard to reporting and recording organizational documentation.

Tools, equipment and materials required may include:

Nil

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be used 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
✓ Wide knowledge on different programing platforms ✓ Knowledge on Software and hardware requirements to create and run the application ✓ Broad knowledge on various programing language and proper use of them	✓ Problem solving skills ✓ Working with different OS platforms ✓ Reading skills required to interpret work instructions ✓ Communication skills needed to interpret and define work procedures ✓ Working with different programing languages

UNIT TITLE	**Fundamentals to Web Development**					
DESCRIPTOR	This unit describes the knowledge required to web based automation of organizations tasks.					
CODE	ICTS01CR03V2/20	**LEVEL**	IV	**CREDIT**		9

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1 Introduction to web development	1.1 Importance of migrating to a web-based system is explained 1.2 Applications and hardware requirements for a local web-based system is explained
2 Install and configure applications required for web development	2.1 Applications required for web development is obtained and installed 2.2 Applications are configured to meet the required task
3 Introduction to HTML	3.1 The basics of Hypertext Mark-up Language (HTML) 3.2 Basic structure of a web page is explained 3.3 Fundamentals of HTML elements ate highlighted 3.4 Static page is created using HTML
4 Introduction to CSS	4.1 The basics of CSS is explained 4.2 Basic structure of CSS is explained 4.3 CSS is applied to a static page created using HTML
5 Introduction to Java Script	5.1 The basics of Java Script is explained 5.2 Basic structure of Java Script is explained 5.3 Java Script is applied to a static page created using HTML and CSS

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, and desktop computers, Cloud services etc.

Software

Includes but not limited to: Text editors, Web development tools, Web Designing tools etc.

Languages
Use of latest stable version of the languages.

Should comply with the latest standards of web development technologies

Literacy skills

In regard to reporting and recording organizational documentation.

Tools, equipment and materials required may include:

Nil

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be used 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
- Created a functional static website

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
✓ Wide knowledge on different programing platforms ✓ Knowledge on Software and hardware requirements to create and run the application ✓ Broad knowledge on various programing language and proper use of them	✓ Problem solving skills ✓ Working with different OS platforms ✓ Reading skills required to interpret work instructions ✓ Communication skills needed to interpret and define work procedures ✓ Working with different programing languages

UNIT TITLE	Creating a Website with CMS				
DESCRIPTOR	This unit describes the knowledge required to create a fully functional website using content management system.				
CODE	ICTS01CR04V2/20	**LEVEL**	IV	**CREDIT**	7

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1 Plan and prepare for building a website	1.1 Organization's requirements are identified 1.2 Site map is created in line with organizations requirements 1.3 Security measurements of the website are identified 1.4 A proper stable and up to date platform is identified 1.5 Domain name and reliable web hosting service is identified
2 Designing the pages	2.1 A relevant theme is selected for the website 2.2 Essential plugins are identified and installed 2.3 Pages are created and designed according to the site map 2.3 Standard Website optimization strategies are followed
3 Testing the website	3.1 Functionality of the website is tested 3.2 Compatibility of the website is tested 3.3 Performance of the website is tested 3.5 Security of the website is tested
4 Maintaining the website	4.1 Regular check of Software updates 4.2 Regular check of Compatibility of the website 4.4 Regular check of Performance of the website

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

Includes but not limited to: Open source CMS, text editors, designing tools etc.

Hardware

Includes but not limited to: Servers, desktop computers, Cloud service etc.

Literacy skills

In regard to reporting and recording organizational documentation.

Tools, equipment and materials required may include:

Nil

ASSESSMENT GUIDE

Form of assessment

Continuous assessments together with collected evidence of performance will be used 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.
- Understand the use of different platforms
- Created a fully functional website using CMS
- Documented the tasks undertaken.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Wide knowledge on different CMS platforms ✓ Broad knowledge on functions of themes and plugins ✓ Knowledge on general security measurements of a Website ✓ Broad knowledge on basic characteristics of a website	✓ Problem solving skills ✓ Working with different CMS platforms ✓ Creating websites with CMS ✓ Reading skills required to interpret work instructions ✓ Communication skills needed to interpret and define work procedures