NATIONAL COMPETENCY STANDARD &

COMPETENCY BASED TRAINING CURRICULUM

FOR

Computer Hardware and Network Technician NVQ Level 4

(Competency Standard Code: K72S015)

Developed by;

Validated by;

National Apprentice & Industrial Training Authority
971, Sri Jayawardenepura Mawatha,
Welikada,
Rajagiriya.

Endorsed by;
Tertiary & Vocational Education Commission
"Nipunatha Piyasa",
354/2, Elvitigala Mawatha,
Colombo 05.

Ministry of Skills Development, Employment and Labour Relations

First publication

First Revision   December 2019

Next Revision   December 2021

Published by;

Tertiary and Vocational Education Commission

354/2, "Nipunatha Piyasa", Elwitigala Mawatha,

Narahenpita, Colombo 5, Sri Lanka.

Tel: +94115849291

Fax: +94 112555007

E-mail: info@tvec.gov.lk

Web: www.tvec.gov.lk

Directed by

Ministry of Skills Development, Employment and Labour Relations

PREFACE

National Competency Standards (NCS) and curriculum are an essential element for the implementation of a unified Technical and Vocational Education & Training System for Sri Lanka and forms the basis for the National Vocational Qualification Framework of Sri Lanka, which provides for the award of nationally and internationally recognized qualifications. The NCS are developed in consultation with industry and are designed using a nationally agreed specific format to maintain uniformity and consistency of standards amongst occupations.

The NCS specify the standards of performance of a competent worker and the various contexts in which work may take place. NCS also describe the knowledge, skills and attitudes required in a particular occupation. NCS and curriculum provide explicit advice to assessors and employers regarding the knowledge, skills and attitudes to be demonstrated by the candidates seeking formal recognition for the competencies acquired either following training or through work experience.

NCS focus on what is expected of a worker in the workplace and the curriculum focus the learning process.

- NCS stress upon the ability to transfer and apply knowledge and skills to new situations and environments.
- In NCS and curriculum the emphasis is upon outcomes and upon the application of knowledge and skills, not just the specification of knowledge and skills.
- NCS and curriculum are concerned with what people are able to do and the ability to do a task in a range of contexts.
- NCS and curriculum include all aspects of workplace performance and not only narrow task skills. NCS can serve a number of purposes including:
  - o Providing advice to curriculum developers about the knowledge, skills and attitudes to be included in the curriculum.
  - o Providing specifications to Competency Based Assessors about the knowledge, skills and attitudes to be demonstrated by candidates.
  - o Providing advice to industry about job functions, which in turn can be used for the development of job descriptions, performance appraisal systems and work flow analysis.

The lead organization for the development of NCS and curriculum is the National Apprentice & Industrial Training Authority. The standards so developed are endorsed by the Tertiary & Vocational Education Commission as National Documents.

There is a requirement to review the standards within the prescribed period as appropriate as and when required, with the assistance of relevant industry groups and incorporate the changes in the National Competency Standards.

Eng. Nazeer Ahamed
Chairman
National Apprentice & Industrial Training
Authority

Mr.R.D.S.Kumararatne
Director General
Tertiary & Vocational Education
Commission

**NATIONAL COMPETENCY STANDARD & COMPETENCY BASED TRAINING
CURRICULUM
For
Computer Hardware and Network Technician
NVQ Level 04**
(Competency Standards Code: K72S015)

Section 1

NATIONAL COMPETENCY STANDARD
FOR THE OCCUPATION OF
COMPUTER HARDWARE AND NETWORK TECHNICIAN
NVQ Level 04

Section 1: Competency Standards

Competency Unit :	Assemble computer components and install software
Unit Descriptor :	This unit covers the competencies required to work with computer hardware and peripherals, assemble, install them as per the requirement and instruction given in the manual /user guide ensuring a safety of the system and safe use of related tools and equipment
Unit Code:	K72S015U01

Element/Task	Performance Criteria/Standards
1. Prepare for work activities	1.1 Adhered to **industrial health & safety procedures** related to the preparation of work activities 1.2 Recommended tools, equipment, software and related accessories (where necessary) 1.3 **Documents** related to carryout work are collected from the relevant authorities
2. Identify Computer Components and system	2.1 Customer requirement/s identified by communicating effectively 2.2 Configuration of the computer identified as per the customer requirement 2.3 Variations of components and their functionalities identified according to the requirement 2.4 Industry trends identified in computer systems according to the requirement
3. Assemble a computer	3.1 **Specifications of the components** checked and ensured that they confirm to the required configuration 3.2 Components connected to the motherboard and mounted inside the casing and installed as per the manufacturer's manuals
4. Configure and install OS and Application software	4.1 Basic Input Output System (BIOS) configured as per the given instructions 4.2 operating system installation procedures followed as per the installation instructions 4.3 **Bootable Device** created as per the relevant guidelines 4.4 Disk partitioning and formatting performed according to the standard practice 4.5 Device drivers checked and installed as required 4.6 Application software installed according to the requirements
5. Install and Configure Peripheral Devices	5.1 **Peripheral Devices** and their functionality identified as per the system specifications 5.2 Compatibility of the devices checked with the existing system 5.3 Peripheral Devices installed as per the operational/ user

	manual
	5.4 Functionality of the Peripheral devices checked as per the operational /user manual

Range/Context:

Competencies in this unit may be performed in a general PC assembling center

Elaboration of terms

Industrial health and safety procedures may include prevailing standards in the workplace or organization. Rules, regulation and procedures published by Labor department, Engineering council of Sri Lanka and recommended present practices accepted by the above authority

Documents may include service/ user manual and technical diagrams

Specifications of the components may include check the user manuals of the relevant hardware part

Bootable Device may include Windows or Linux based, CD/DVD, Pen drive, Network boot (Windows deployment services), disk clone

Peripheral Devices may include DVD/CD Drive (optical drives), Mouse, Keyboard, Monitor, Printer, Scanner, Projector, etc

Critical aspects

The assessment must confirm that the candidate is able to:

- Assemble components according to the given specifications
- Install operating system and software

Tools/Instruments & Equipment/Documents/References/Standards:

- Personal Computer
- PC Assembly Workbenches
- Anti-Static table Mat
- Related user manuals provided by manufacturer
- Professional computer hardware tool kit
- Anti-Static Wrist Strap
- Flat Head Screw Driver
- Philips Screw Driver
- Pliers
- Operating systems, application software
- driver software
- PPE

7

Required Knowledge, Skills and Worker behavior/Attitude/Soft skills

Knowledge	Skills ,Worker behavior/Attitude/Soft skills
- Basic electricity & Electronics - computer Components and peripherals specifications - Computer types and usage - proper use of tools - setup and configuration of peripherals devices - Occupational health & safety procedure - Waste disposal methods - PPE	- Planning and organizing skills - Ability to understand and explain product standards and specifications - Ability to read and interpret basic instructions in English - Use of tools - Reading Skills - Communication and presentation Skills - Team Working - Problem solving skills - Use of personal protective equipment

Competency Unit :	Perform IT Helpdesk process
Unit Descriptor :	This unit covers the competencies required to support End Users by performing IT help desk process
Code:	K72S015U02
Element/Task	Performance Criteria/Standards
1. Prepare for work activities	1.1 Adhered to *industrial health & safety procedures* related to the preparation of work activities 1.2 *Documents* related to carryout work are collected from the relevant authorities
2. Identify quality requirement	2.1 **Service Level Agreements** (SLA) identified as per the organizational policy 2.2 **Service Level Agreements** followed as per the SLA manual 2.3 **Helpdesk procedures** followed as per the quality standards
3. Assist customers	3.1 Requests for technical assistance in person responded via phone, chat or email 3.2 Technical hardware and software issues diagnosed and resolved and user advised on appropriate action 3.3 All help desk interactions logged according to the organizational procedure 3.4 Situations requiring urgent attention escalated and identified
4. Initiate issues tracking tools	4.1 Hierarchy of the IT helpdesk reporting guidelines followed 4.2 Issue and escalation procedure handled according to the organizational procedure 4.3 Ticket closing procedure followed as per the organizational procedure 4.4 Records of Frequently asked questions (FAQ) and the complaints/issues maintained as per the organizational procedure

Range/Context:

Competencies in this unit may be performed in an IT Support Environment of small and medium level enterprises

Elaboration of terms

Industrial health and safety procedures may include prevailing standards in the workplace or organization. Rules, regulation and procedures published by Labour department, Engineering council of Sri Lanka and recommended present practices accepted by the above authority

Documents may include service/ user manual and technical diagrams

Service Level Agreements may include Contract between a service provider and its internal or external customers

Helpdesk procedures may include an effective IT support policy includes information about the level of service that the help desk provides.

Critical aspects
The assessment must confirm that the candidate is able to:

- Aware relevant Service Level Agreements (SLA)

Tools/Instruments & Equipment/Documents/References/Standards:

- Personal Computer / Laptop
- Internet Facility
- HelpDesk Software (Eg. osTicket/Jira service desk)

Required Knowledge, Skills and Worker behavior/Attitude/Soft skills

Knowledge	Skills Worker behavior/Attitude/Soft skills
• Helpdesk support process • Helpdesk ticketing software • Service level agreement • Organizational procedures	• Oral and written communication skills • Learning skills • Customer service orientation • Problem analysis • Problem-solving • Adaptability • Team interaction • Planning and organizing • Attention to detail • Stress tolerance

Competency Unit :	**Perform the basic configuration on Small Office Home Office (SOHO) network**
Unit Descriptor :	This unit covers the competencies required to configure the basic network settings
Code:	K72S015U03
Element/Task	**Performance Criteria**
1. **Select network type and components**	1.1 **Network topologies** identified according to the customer requirement 1.2 **Host, networking devices and** peripherals configured as per the network 1.3 TCP/IP configured as per network
2. **Use Network commands and Tools**	2.1 **Structured cabling Tools** selected according to the network purpose 2.2 Network connectivity verified using **basic commands**
3. **Install & configure Network Devices**	3.1 Integrated services Routers (ISR) configured according to the requirement 3.2 Wired and wireless end devices installed and configured as required 3.3 **Firewall and** Proxy **features** in **software** Configured as per the customer requirement
4. **Configure server roles/ Network Services**	4.1 Workgroup and **Domain Network** Configured according to customer/ requirement 4.2 Active Directory/LDAP service configured according to the customer requirement 4.3 Users and polices managed as per customer/ requirements 4.4 **Server roles/ Network services** configured as per the customer/ requirement
5. **Configure network monitoring and Surveillance system**	6.1 DVR with Cameras Installed and Configured as per the customer requirement 6.2 NVR with IP Cameras Installed and Configured as per the customer requirement 6.3 **Remote Monitoring** Application Installed and Configured as per the customer requirement
6. **Configure and manage mobile devices**	7.1 Network connectivity on mobile devices Configured as per configuration guidelines 7.2 Email configuration on mobile devices configured as per requirement

Range/Context:

Competencies in this unit may be performed in an environment of setting up Physical Network Infrastructure, routers, switches, ISP Devices and configuring Active Directory/LDAP including other directory services.

As well as Setting up Web Server, Proxy server and Data Base Server, Cloud Infrastructure and cloud Services and Surveillance System.

Elaboration of terms

Network topologies may include Star, Bus, and Ring topology

Host may include End devices **which** are directly connected to the network

Networking Devices may include Routers, switches, Access point, etc

Structured cabling Tools may include Tools which are used for prepare network. Eg. Crimping Tool, Cable Tester, etc

Firewall and Proxy features may include port forwarding, IP blocking, URL and content filtering

Software may include PFsense, clearOS, squid proxy, zentyal

Basic commands may include ipconfig/ifconfig, ping, nslookup, traceroute/tracert, etc

Domain Network Environment may include one or more computers are servers. Network administrators use servers to control the security and permissions for all computers on the domain

Server roles/ Network services may include
- DNS (Windows Server)
- DHCP (Windows Server)
- File Server (Windows Server)
- Print Server (Windows Server)

Remote Monitoring may include Simple network management protocol (SNMP) based network monitoring applications eg. PRTG, ZABIX, CACTI, etc.

Critical aspects

The assessment must confirm that the candidate is able to:

- Identify network topologies and logical addressing
- TCP/IP configuration
- Use basic network commands

- Use wired and wireless network

Tools/Instruments & Equipment/Documents/References/Standards:

- Personal Computer / Laptop
- Server Computer
- UPS
- Network Printer
- Hammer drill
- Codeless Drill (Codeless Screw Drive)
- Network Switch
- Wireless Access Point
- Multi-meters
- Soldering Iron
- Soldering Stands
- De Soldering Pump
- Ladder
- Smart Phone
- CCTV Test Monitor (Portable)
- 4 Channel DVR with CCTV Camera (Complete pack)
- 4 Channel NVR with IP Camera (Complete pack)
- Wire Stripper
- Tone Probe
- Network Cable Tester
- Crimping Tool
- Punch Down Tool
- Krone Tool
- Flat Head Screw Drive
- Philips Screw Drive
- Claw Hammer
- Pliers
- Flash drives ,CD, DVDs
- Measuring Tape (Recommended 100m)
- Relevant software

Eg.

   - o Windows & Linux client Operating System
   - o Windows Server Operating System
   - o Linux Server Operating System
   - o Device Drivers
   - o ***PFsense, clearOS, squid proxy, zentyal***
   - o PRTG, ZABIX, CACTI

Required Knowledge, Skills and Worker behavior/Attitude/Soft skills

Knowledge	Skills Worker behavior/Attitude/Soft skills
- Network types & its usage - Basic Mathematical operations and numbering system (Decimal, Binary, Octal, Hexa) - Communication/ transmission media - Following best practices of Installing & configuring equipment and software - Surveillance system Setup & configuration - Server Roles and Services - Cloud Computing - Occupational Health and Safety procedure - Awareness of IP address - LAMP Server (CentOS) - WAMP (Windows Server) - WDS (Windows Server) - LADP server - Cloud computing (OpenStack, VMware, AWS,GCP,Azure) - Office 365, Gsuite	- Ability to understand and explain product standards and specifications - Ability to read and interpret basic instructions in English. - Use of Equipment - Communication skills - Writing Skills - Team Works - Numerical skills - IT Literacy - Measurement Skills - Use of personal protective equipment

Competency Unit :	Apply IT Infrastructure Security		
Unit Descriptor :	This unit covers the competencies required to ~~create and~~ apply security practices ethically and legally		
Code:	K72S015U04		
Element/Task	Performance Criteria		
1. Identify Security Essentials	1.1	Security threats and vulnerabilities identified according to the organizations' IT infrastructure	
	1.2	*Security best practices* identified as per the organizational infrastructure security policy	
2. Apply Anti-malware software for computers	2.1	Available *anti- malware software* in the industry selected as per the customer/ environment and requirement	
	2.2	Anti-**malware** software installed and configured as per guideline	
	2.3	Patch update performed according to the installed software	
3. Prevent cyber threats	3.1	Latest cyber threats described as per the organizations' IT infrastructure	
	3.2	Prevention from cyber threats carried out as per organizational practices	
4. Carry out Vulnerability Assessment	4.1	*Vulnerability Assessment* Tools Selected as required	
	4.2	Vulnerability scanned by using selected vulnerability Assessment Tools	
	4.3	*Vulnerability Patches* applied to resolve the vulnerabilities detected	
5. Follow Ethical and Legal Considerations	5.1	Available *Ethical and Legal Consideration* identified as organizational requirement Customer made aware on importance of *Software License*	
	5.2	Customer made aware on cyber laws according to the country, region and state	

Range/Context:

Competencies in this unit may be performed in an information security environment of small and medium level enterprises

Elaboration of terms

Anti- malware software may include prevention, detection and removal of malicious software from computer systems and devices

Cyber threats may include social engineering attacks (Eg. Phishing, tailgating, spam, etc)

Vulnerability Assessment may include vulnerability identification, Analysis, Risk Assessment, Remediation

Ethical and Legal consideration may include the current industry ethics

Software Licensing may include according to the current industry

Critical aspects

The assessment must confirm that the candidate is able to:

- Identify security threats
- Identify ethical and legal requirement of software

Tools/Instruments & Equipment/Documents/References/Standards:

- Personal Computer / Laptop
- Internet Facility
- Antivirus software
- Vulnerability Assessment Tools (Eg. OpenVas, NESSUS, Nmap, Zenmap)

Required Knowledge, Skills and Worker behavior/Attitude/Soft skills

Knowledge	Skills Worker behavior/Attitude/Soft skills
- IT literacy - Install system and application software - Identification and prevention from threats and vulnerabilities - ICT laws and acts - Practical use of tools - Software Licenses	- Reading /writing skill - Communication skills - Team work - Analytical skills - Handling vulnerabilities assessment tools

Competency Unit :	Troubleshoot of Hardware, Software and Network
Unit Descriptor :	This unit covers the competencies required to troubleshoot and reinstall hardware, software and network system issues
Code:	K72S015U05
Element/Task	Performance Criteria
1. Diagnose & Identify faults	1.1 Customer / client communicated to identify problem and repair history if available 1.2 Cause of the fault in Hardware, software or network identified following specified procedure 1.3 Customer informed of the repair /replacement necessary with estimated cost, and approval obtained to proceed with the repair.
2. Perform repairs to rectify faults	2.1 Required compatible hardware components installed and configured as required 2.2 Required network/surveillance system components installed and configured as required 2.3 *software related issues* rectified 2.4 Operating system and/or applications updated/ re-installed as required.
3. Check system for performance	3.1 Re-installed hardware or network/ surveillance system components checked for standard performance. 3.2 Re-installed software checked for standard performance. 3.3 Operation of any new devices checked for inter-operability with existing hardware/software 3.4 Findings, actions and outcomes reported and documented as per the organization procedure

Range/Context:

Competencies in this unit may be performed in troubleshooting of hardware, peripherals, network, surveillance system components, operating system and software

Software related issues may include operating system issues, software packages issues

Critical aspects

The assessment must confirm that the candidate is able to:

- Fault diagnoses and reinstall
- Software / hardware component compatibility
- Safe attending to the reinstall

Tools/Instruments & Equipment/Documents/References/Standards:

- Personal Computer / Laptop
- Server Computer
- Standby UPS
- Scanner
- Network Support Printer
- Unmanageable Network Switch
- KVM (Keyboard, Video, Mouse) Switch
- Wireless Access Point
- Multi-meters
- Soldering Iron
- Soldering Stands
- De Soldering Pump
- Cleaning Brush
- Magnify Glass
- Android Smart Phone
- CCTV Test Monitor (Portable)
- 4 Channel DVR with CCTV Camera (Complete pack)
- 4 Channel NVR with IP Camera (Complete pack)
- Hot Air Gun
- DC Power Supply Unit
- Power Supply Tester
- Multi Card Reader
- Blower
- Workshop Table
- Anti-Static Wrist Strap
- Anti -Static Brush
- Wire Stripper
- Tone Probe / Network Cable Tester
- Crimping Tool
- Punch Down Tool
- Krone Tool
- Flat Head Screw Drive
- Philips Screw Drive
- Claw Hammer
- Pliers
- Relevant software
  Eg.

    o Windows client/server Operating System
    o Linux client/server Operating System
    o Device Drivers
    o Software firewall (Eg:PFSence, Zentyal)
    o Windows Proxy Server (Eg:CCProxy)

- o Linux Base Proxy Server (Eg:Squid, Zentyal)
- o LAMP Server (Linux, Apache, MySQL, and PHP)
- o WAMP Server (Windows, Apache, MySQL, and PHP)
- o LDAP / Active Directory server
- o Private Cloud (Eg:OpenStack, VMware)
- o Public Cloud (Eg:AWS,GCP,Azure)
- o office 365, Gsuite

Required Knowledge, Skills and Worker behavior/Attitude/Soft skills

Knowledge	Skills Worker behavior/Attitude/Soft skills
• Troubleshooting procedure • Job card / workorder • Error signal (visual & audible) • Minimum Hardware Requirements for specified software • CLI (Command Line Interface) Commands and related tools • Basic mathematical operation/numbering system • Safety procedure	• Analytical Skill for hardware /network troubleshooting • Communication skills • Reading / writing skill • Team work • Reporting and recording • Use of personal protective equipment

Competency Unit :	Perform backup/restore tasks and identify disaster recovery strategies
Unit Descriptor :	This unit covers the competencies required to perform **backup/restore tasks and identify** disaster recovery **strategies to ensure Business Continuity**
Code:	K72S015U06
Element/Task	Performance Criteria
1. **Select the proper storage media**	1.1 Customer consulted and requirements identified 1.2 Customer advised on the necessity of backing up data regularly and the options available for doing this. 1.3 Appropriate storage media selected to suit the capacity of the data and the organization requirement
2. **Perform Backup and Restore data**	2.1 **Type of backup** and restore techniques identified as per organization requirement 2.2 Data backed up/restored using the specified procedure 2.3 Automatic backup procedures set up as per the organization requirement
~~3.~~ **Ensure availability of disaster recovery plan**	3.1 Customer advised on the importance of the backup/restore procedures and disaster recovery plan 3.2 Customer advised on backup frequency based on the business requirement 3.3 Customer advised to keep off-shore backups.

Range/Context:

Competencies in this unit may be performed in taking backups & restoring, **and testing the knowledge of disaster recovery & Business Continuity plan**

Elaboration of terms

Type of backups may include full backup, incremental backup

Critical aspects

- Ability to backup/restore data on a PC
- Setup automatic backup procedures and advise the customer on backup and restore procedures.
- Ability to identify disaster recovery and business continuity plan

Tools/Instruments & Equipment/Documents/References/Standards:

- Personal Computer/Laptop
- Backup tools (Eg: Acronis, Red Gate, Cloud Berry, VEEAM Backup)

- Cloud storage {Eg: AWS S3, AWS Glacier)
- Virtual Tape Libraries

Required Knowledge, Skills and Worker behavior/Attitude/Soft skills

Knowledge	Skills Worker behavior/Attitude/Soft skills
- Usage of backup/restore methods, tools and devices - Type of Backup - Disaster recovery plan - Business continuity plan	- Analytical Skill - Communication skills - Reading / writing skill - Team work

Unit Title:	**Practice workplace communication and interpersonal relations**
Unit Descriptor:	This unit covers the competencies required to co-operate with others, interact effectively and deal with information within the workplace
Unit Code:	**K72S015U07**

Element	Performance Criteria
1.Co-operate with others in performing work	1.1 Work is performed in co-operation with others in a friendly & courteous manner 1.2 Verbal and non-verbal communication are used appropriately 1.3 Ideas, opinions and interactions are shared & respected appropriately 1.4 Work is performed in co-operation with team members and related technical staff appropriately
2.Work with people of diverse backgrounds	2.1 People of a variety of backgrounds are accepted without prejudice 2.2 Respect for cultural, ethnic and gender differences are practised appropriately
3. Obtain record and convey workplace information	3.1 Effective questioning, active listening, reading and speaking skills are used to gather information 3.2 Information and ideas are transferred without distortion 3.3 Work place interaction is conducted in a courteous manner 3.4 Approved work instructions are obtained and followed in appropriate manner 3.5 Collected information are recorded for easy reference
4. Fill work related documents	4.1 Work related forms and formats is identified appropriately 4.2 Range of forms and formats relating to work is filled appropriately 4.3 Reporting requirements to supervisor is completed accurately in accordance with organizational guide lines and timelines.

Range/Context:

The performance of activities included in this unit may take place in training centre. Communication will include verbal, non-verbal, written, printed and electronic forms. It applies to individuals, groups and co-workers as well as others.

Critical Aspects:

The assessment must confirm that the candidate is able to;
- Obtain accurate information from customer/superior/co-workers
- Accurate record of information
- Convey information to relevant parties accurately

Tools/Instruments & Equipment/Documents/References/Standards:

Tools & Equipment	Documents/References/Standards:
• Pens/pencils/rulers/calculator • Paper/notebooks • Telephones	• Charts • Graphics • Memos • Formats & Forms • Standard Organizational Procedures and accepted ethical standards and norms

Required Knowledge, Skills and Worker behavior/Attitude/Soft skills

Knowledge	Skills
• Safety symbols & procedures • Basic English relevant to workplace and type of work • Organisation's rules, regulations and procedures • General norms of polite conduct • Forms of address appropriate to customers and persons in different positions • Basic knowledge of customs and practices of different ethnic and religious groups • Good telephone manners • Basic understanding of gender issues	• Speak clearly and express varied ideas • Write clearly and legibly • Read and understand simple English relevant to the workplace • Write simple explanations in English language • Communicate effectively using the telephone • Perform simple calculations Make simple sketches

Unit Title :	Apply occupational literacy and numeracy
Unit Descriptor:	This unit covers the competencies required to apply literacy and numeracy to participate effectively in activities in the workplace
Unit Code:	K72S015U08
Element	Performance Criteria
1.Employ basic mathematics to complete work tasks and solve problems	1.1 Computation skills are demonstrated using decimal, Binary, Hexa and Octal numbers 1.2 Key concepts and principles of mathematics are applied to understand and solve workplace calculations. 1.3 Key concepts and principles of basic Geometry are applied to understand their use in the workplace. 1.4 Computation skills are demonstrated related with work activities
2.Communicate ideas in writing	2.1 Adequate vocabulary is maintained for everyday tasks according to nature of work 2.2 Written material is produced to convey intended message in familiar work context 2.3 Appropriate units, codes and symbols are selected according to purpose of written material
3. Read range of written materials	3.1 Adequate vocabulary is maintained to read range of written materials according to workplace requirements 3.2 Appropriate units, codes and symbols are interpreted for the purpose of reading 3.3 Information are gained from text integrated with own knowledge in order to create meaning

Range/Context:

Activities included in this unit may take place in a training centre, and will include but not be limited to reading reports, instruction sheets, technical manuals and other types of written material in English, writing in English sentences, and performing simple work related calculations employing basic mathematical operations.

Critical Aspects:

The assessment must confirm that the candidate is able to;
- Interpret written material accurately
- Convey ideas clearly and correctly in writing
- Adopt appropriate method in mathematical calculations

Tools/Instruments & Equipment/Documents/References/Standards:

Tools & Equipment	Documents/References/Standards:
• Pens/pencils • Paper/notebooks	• Charts • Manuals

Calculator	• Memos
	• Formats & Forms
	• Accepted rules of grammar and syntax
	Fundamental principles of mathematics

Required Knowledge, Skills and Worker behavior/Attitude/Soft skills

Knowledge	Skills
• Grammar, spelling and syntax	• Write clearly, legibly and correctly
• Mathematical representation of physical quantities	• Read and understand simple English relevant to the workplace
• Basic Mathematical operations	• Write simple sentences in English
• Adequate technical vocabulary in English	• Perform simple calculations
• Principles of basic of Geometry	• Draw simple Geometrical views
• Basic knowledge of new trends in IT sector	

Unit Title :	Work in teams
Unit Descriptor :	This unit covers the competencies required to work collaboratively and in cooperation with others, and identify roles & responsibilities of members of the team
Unit Code:	K72S015U09

Element	Performance Criteria
1.Understand team role and scope	1.1 Formal and informal teams and their roles and limitations are identified in the job site 1.2 Responsibilities, characteristics and relationship of team members are explained to accomplish team goals
2.Participate as a team member	2.1 Different forms of communication are used with team members to contribute to team objectives 2.2 Appropriate contribution (participation) is made to the team to meet team goals 2.3 Safety of team members is ensured when performed work operations appropriately 2.4 Different viewpoints and ideas are respected as required to meet team goals 2.5 Collective decisions are accepted as required to meet team goals
3. Maintain productive group relations	3.1 Individual's role and responsibility within the team is clearly identified 3.2 Other's roles and responsibilities are identified and understood 3.3 Harmonious relations are maintained and respected within the team and with others 3.4 Team relationship is maintained to understand target completion and score zero accidents

Range/Context:

The performance of activities included in this unit may take place in training centre and will include but not be limited to identifying individual's and other's roles and responsibilities within the team and maintaining harmonious relations.

Critical Aspects:

The assessment must confirm that the candidate is able to;
- Achieve team goals and individual goals
- Follow designated work plan for the job
- Respect to other's ideas

Tools/Instruments & Equipment/Documents/References/Standards:

Tools & Equipment	Documents/References/Standards:
• Depending on the job assigned to the team for the purpose of assessing this unit, required tools, equipment and material will be provided.	• Work plans • Manuals • Handbooks • General rules and norms guiding team behavior

Required Knowledge, Skills and Worker behavior/Attitude/Soft skills

Knowledge	Skills
• Simple concepts of team behaviour • Elementary group dynamics • Basic knowledge in social and demographic structures	• Work effectively and comfortably as a member of a team • Patience • Understand others

Competency Unit :	**Practice occupational health and safety procedures in an workplace**
Unit Descriptor :	This unit describes the performance outcomes required to identify and follow safety and emergency procedures in a work place It includes the individual's responsibility for safety and emergency response in the event of an accident or incident.
Unit Code:	**K72S015U10**

Element	Performance Criteria
1. **Identify and follow workplace safety procedures**	1.1 **Work place procedure** relating to personal safety are identified and followed 1.2 Unsafe situations and hazards are identified and reported according to workplace 1.3 Machinery and equipment breakdowns are identified and reported according to workshop procedures 1.4 Fire hazards are identified, different fire protection equipment and material and their methods of use identified as required for different types of fires 1.5 Safety signs and symbols are identified and followed 1.6 Work place procedures and safety requirements for handling and storing dangerous goods and hazardous substances are identified and followed 1.7 Manual handling procedures and ergonomic parameters are identified and followed 1.8 Health and Safety awareness programmes are participated 1.9 Appropriate PPE are used/ worn according to organisation's requirements & manufacturer's instructions 1.10 **First aid** procedures is performed as needed 1.11 Daily and weekly safety & health check list is followed as per organization requirement
2. **Identify and follow workplace emergency procedures**	2.1 Electrical, chemical and biological hazards recognized, identified and reported promptly. 2.2 Regarding illness and accidents are identified and followed 2.3 Firefighting appliances and equipment are located and identified for emergency use and application 2.4 **Qualified persons** are identified for contacting in the event of an incident, accident or sickness of self, co-workers, staff, customers and others 2.5 Accident and incident documentation requirements are followed work place procedures
3.Adhere to good environmental practices	3.1 Environmental impact of tasks are performed identified and action taken to mitigate 3.2 Recover, reuse, recycle and reduce procedure are identified and followed

Range/Context:

Activities included in this unit may take place in a work place, and will include but not be limited to identifying potential hazards, taking effective preventive action to control or minimise such hazards, using personal protective equipment, using fire extinguishers and maintaining records of safety related activities.

Elaboration of terms:

Workshop procedures must include procedures for:

- Selecting and using personal protective equipment (PPE)
- Identifying hazards
- Emergency, fire and accident.
- Regular cleaning of Uniforms

First aid procedures may include but not be limited to treatment of minor cuts, bruises and burns, applying bandages and tourniquets

Qualified persons must include:

Those holding a current recognized qualification in any of the following:

- First aid
- Cardiopulmonary resuscitation
- Fire warden
- Occupational or work health and safety representative

Critical Aspects:

The assessment must confirm that the candidate is able to:

- Identify potential hazards
- Adhere to safety procedures
- Use most appropriate tools for a task

Tools/Instruments & Equipment/Documents/References/Standards:

Tools & Equipment	Documents/References/Standards:
• Safety signs and symbols • Posters • First aid box with essential items • Fire protection equipment	• Health & safety procedure manual • Organisation's health & safety procedure manual • Factories' Ordinance No.45 of 1942 and its amendments

Required Knowledge, Skills and Worker behavior/Attitude/Soft skills

Knowledge	Skills

Individuals must be able to demonstrate knowledge of:
 	
Basic aspects of relevant OHS legislation, including:
• employer responsibilities
• employee responsibilities to participate in WHS practices
• employee responsibility to ensure own work practices protect the safety of self, other workers and other people
 	
Manual handling, including:
• storing items
• planning the lift
• using correct lifting techniques and equipment
 	
Work place practices, including:
 	
• housekeeping
• observing personal hygiene
• identifying slip hazards and trip hazards
 	
OHS symbols and signs, Machine and equipment safety, including:
• electrical tools, including:
    - checking before use
faulty equipment tagging and isolation procedures
    - dangers of using electrical tools around water
 	
Emergency procedures, including:
• personnel responsibilities
• Evacuation procedures and assembly points.
	• Learning skills to:
	
	Locate sources of information relating to safety requirements.
	
	• Reading skills to:
	
	Interpret information from manufacturer and literature when seeking procedures required carrying out work safely.
	
	• Writing skills to:
	
	Legibly and accurately enter information into work place safety documents and check sheets.
	
	• Oral communication skills to:
	
	Clarify instructions inform personnel of work place hazards.
	• Numeracy skills to:
	
	Match hazardous material weights and volumes to safety data sheets (SDS) and work instructions.
	
	6 Planning and organizing skills to:
	Plan own work requirements to achieve required outcomes while working according to safety requirements.
	
	7 Self-management skills to:
	
	Follow work place safety requirements without constant supervision identify and look after own safety.

Section 2

CBT CURRICULUM

FOR THE OCCUPATION OF

Computer Hardware and Network Technician

NVQ Level 04

Module - 1

Module Title	**Assembling a computer and installing software**
Module Code	K72S015M01
Module Type	Core Competency
Duration (Hrs.)	250 Hours
Learning Outcomes	After completion of this module the trainee will be able to: • describe basic electricity & electronics • Identify the component of the computer system • Assemble the computer according to the given Configurations • Install the Different Operating system using different methodology • Install and configure different application software • Install and configure peripheral devices
Learning Content	_**Theory:**_ • Introduction to present and future types of computers • Introduction to the basic electricity & electronics • Identify the components of the different types of computers and their functionalities (Form Factor, RAM Types, Motherboard form factor, Power Supply Form factor, Hard disk – HDD, SSHD, SSD, PCIe SSD, Adaptor Cards, Processors, etc..) • Preparation of workbench and environment before assembling PC as specified • specifications of the components ~~and~~ checked to ensure that they conform to the required configuration • instructions to install components of the computer adhering to safety aspects • Installing different types of OS/es using different methods - Bootable CD/DVD - Bootable USB - Network Boot (PXE) - Disk Clone • Disk partitioning and formatting according to the requirements (NTFS,FAT 32, exFAT, Ext3, Ext4, XFS, APFS) • Verify Device drivers • Installing Application software according to the requirements • installing Peripheral Devices as per given instruction/ Operational Manuals 100 hrs
	**Practical:** • Soldering and de-soldering • Measure voltage, current and resistance using multi-meter • Assemble a basic computer • Install Operating System using different methods

	• Install and configure application software
	• Install and configure peripheral devices
	150 hrs
Teaching-Learning activities	• Illustrated talk
	• Demonstrations
	• Individual practices
	• Video clips
	• Presentation
Assessment weightage	Formative Assessment + Summative Assessment

Module-02

Module Title	**IT Help Desk Process**
Module Code	K72S015M02
Module Type	Core Competency
Duration (Hrs.)	70 Hours
Learning Outcomes	After completion of this module the trainee will be able to: • Interpret Service Level Agreements • Resolve customer issues • Identify and use Issue tracking tools

Learning Content	*__Theory:__*
	• Importance of the SLA (**Service Level Agreements)**
	• Content of the General SLA
	  - Guaranteed response time (often based on type of call and level of service agreement)
	  - Equipment/ Software that is supported
	  - Where service is provided
	  - Preventive maintenance (Frequency, work covered)
	  - Diagnostics
	  - Commitments of Part availability (equivalent parts)
	  - Cost and penalties
	  - Time of service availability (for example, 24x7 or Monday to Friday, 8 a.m. to 5 p.m. EST)
	• Manage inventory of equipment and their service logs
	  - Configuration
	  - Location of the equipment
	  - Warranty expiration
	  - Service provider
	  - Preventive maintenance schedule
	  - Service history logs
	  - Date and cost of purchase
	• Usage of issue tracking tools
	30 hrs

	__Practical:__
	• Assist and respond to issues
	  - Diagnose and resolve technical hardware and software issues
	  - log all help desk interactions
	  - identify situations requiring urgent attention
	• Use of issues tracking tools
	  - Recording of issue
	  - Escalation procedure
	  - Ticket Closing Procedure
	• Maintain FAQ
	40 hrs

Teaching-Learning activities	• Illustrated talk • Demonstrations • Individual practices • Video clips • Presentation
Assessment weightage	Formative Assessment + Summative Assessment

Module-03

Module Title	**Configuration of Small Office Home Office (SOHO) network/ surveillance system**
Module Code	K72S015M03
Module Type	Core Competency
Duration (Hrs.)	270 Hours
Learning Outcomes	After completion of this module the trainee will be able to: • Identify networking concept and component • Handle Network tools properly • Build the peer to peer and client server network environment and configure the devices and related services • Describe cloud computing concepts • Install, configure and monitor the surveillance system • Install, configure and manage the mobile devices within network infrastructure

Learning Content	***Theory:***
	• Principals of Networking
	  - components and types of computer networks
	• basic networking concepts and technologies
	    - Configure network connectivity between PCs.
	• types of topologies
	    - purpose and characteristics of networking standards
	    - LAN topologies
	• physical components of a network
	    - purpose of physical components of a network
	• Ethernet standards
	    - Wired and Wireless Standards
	• Networking Standards
	    - OSI and TCP/IP data models
	• Configure unmanageable routers, switches and other network devices
	• Connect and configure client server environment
	    - DNS
	    - DHCP
	    - File Server
	    - Print Server
	    - WDS
	    - LAMP/WAMP
	• Introduction to cloud computing
	    - Types of Clouds
	    - Cloud Computing Services
	    - Cloud Computing Architecture
	    - Virtualization and Cloud Computing:
	    - Grid Computing Vs Cloud Computing

	- Grid Computing and Utility Computing
	    - Security concerns and proposed security model for future cloud computing
	    - Privacy Concern
	• Identify different types surveillance system and their importance
	• Identify different types mobile devices and their importance
	100 hrs

	Practical: • Make a straight through cable and cross over cable • Use punching tools for make network wall outlet or patch panel • Configure Router • Configure Wireless Network Environment • Configure Network Printer • Configure a Domain Network Environment • Configure Active Directory user and polices Management • Configure DNS, DHCP, File Server, Print Server, WDS, LAMP/WAMP • Create cloud-based e-mail (office 365, G-Suite) • Install and Configure DVR with Cameras • Install and Configure NVR with IP Cameras • Install and Configure Remote Monitoring Apps • Configure and secure mobile devices • Troubleshoot mobile devices(Factory reset) 170 hrs
Teaching-Learning activities	• Illustrated talk • Demonstrations • Individual practices • Video clips • Presentation • Simulator
Assessment weightage	Formative Assessment + Summative Assessment

Module-04

Module Title	**IT Infrastructure Security**
Module Code	M-04
Module Type	K72S015M04
Duration (Hrs.)	200 Hours
Learning Outcomes	After completion of this module the trainee will be able to: • Identify Importance ŧ of computer security and threats • Use of *anti- malware* software/tool in industry • Identify type of Vulnerabilities and cyber threats • Describe importance of Ethical usage and Legal implications of unauthorized software/data usage

Learning Content	***Theory:***
	 • Security threats
	 • Security procedures
	 • Importance of installing *anti- malware* software
	 • Basics of cyber threats, their effect and prevention method
	 • Vulnerability and vulnerability assessment tools
	 • Importance of Ethical usage and Legal implications of unauthorized software/data usage
	    - Software Licensing
	    - Follow country, region, or state, Cyber laws and company's policies
	    - Unauthorized data usage
	 Duration 80 hrs

	Practical: • Install and configure *anti-**malware*** software as specified • Harden the system • Identify and install patches for vulnerabilities Duration 120 hrs
Teaching-Learning activities	• Illustrated talk • Demonstrations • Video clips • Presentation • Virtual Machines
Assessment weightage	Formative Assessment + Summative Assessment

Module-05

Module Title	**Troubleshooting Hardware, Networking and Operating Systems**
Module Code	M-05
Module Type	K72S015M05
Duration (Hrs.)	350 Hours
Learning Outcomes	After completion of this module the trainee will be able to: • Identify Hardware & peripheral related problems • Identify Network & related devices problems • Identify OS and Application software issues and troubleshooting • Identify & troubleshoot surveillance systems related issues

Learning Content	***Theory:***
	 • Common Hardware issues in components
	     - Motherboard
	     - RAM
	     - VGA
	     - Hard disk
	     - Power Supply/Power Adaptor
	     - Wireless Adaptor card
	     - Sound Adaptor Card
	     - Optical Drive
	     - Processor
	     - Keyboard
	     - Touch pad
	     - Screen/Display
	     - Interface Ports and Cables
	 • Common issues in Peripheral devices
	     - Printers
	     - Scanners
	     - Projectors
	     - UPS
	 • Common Network Related Issues.
	     - Switch
	     - Router
	     - Access point
	     - ISP Connectivity
	     - Network Configurations
	     - Physical Connectivity
	     - DNS
	     - DHCP
	     - Proxy
	     - Software Firewall
	 • Common Operating System Related Issues.
	     - Startup/Boot Issues
	     - Drivers
	     - Blue Screen Error etc..

	- Common Application related Issues. - AD-DS - Anti-malware - Software Firewall - LAMP/WAMP - Action plan - How to verify the fixes - Documentation of findings, actions and outcomes Duration 100 hrs
	Practical: - Troubleshoot the PC and related hardware devices issues - Motherboard - RAM - VGA - Hard disk - Power Supply/Power Adaptor - Wireless Adaptor card - Sound Adaptor Card - Optical Drive - Processor - Keyboard - Touch pad - Screen/ Display - Interface Ports ~~and~~ - Cables - Troubleshoot Issues in Peripheral devices - Printers - Scanners - Projectors - UPS - Troubleshoot Network Related Issues. - Switch - Router - Access point - ISP Connectivity - Network Configurations - Physical Connectivity - DNS - DHCP - Proxy - Software firewall - Troubleshoot Operating System Related Issues. Startup/Boot Issues, Drivers, Blue Screen Error)

	• Troubleshoot Application related Issues. AD-DS Anti-malware Software firewall LAMP/WAMP • Document findings, actions and outcomes of issues Duration 250 hrs
Teaching-Learning activities	• Illustrated talk • Demonstrations • Video clips • Presentation
Assessment weightage	Formative Assessment + Summative Assessment

Module-06

Module Title	**Disaster recovery & business continuity**
Module Code	K72S015M06
Module Type	Core module
Duration (Hrs.)	120 Hours
Learning Outcomes	After completion of this module the trainee will be able to: • Identify importance of backups • Describe backup types, techniques and media • Identify importance of off-shore backups and Disaster recovery

Learning Content	_**Theory:**_
	• Importance of backups
	• Backup types
	   - Full
	   - Incremental
	   - Deferential
	• Backup/restore techniques and tools
	   - Acronis backup
	   - Cloning
	   - Red Gate
	   - Cloud Berry
	   - VEEAM Backup
	
	• Types of backup media
	   - CD,DVD,
	   - Network drive,
	   - Portable Disk,
	   - Tape Drive,
	   - Backup Storage devices (EMC Data Domain)
	   - Cloud storage (AWS S3, AWS Glacier)
	   - AWS VTL (Virtual Tape Libraries)
	• Advantages of disaster recovery
	• Components of Disaster recovery & Business Continuity plan
	• Off-shore backups
	Duration 45 hrs

	**Practical:** • Create backups • Restore backups Duration 75 hrs
Teaching-Learning activities	• Illustrated talk • Demonstrations • Video clips • Presentation
Assessment weightage	Formative Assessment + Summative Assessment

Module - 07

Module Title	**Workplace communication and interpersonal relations**
Module Code	M-07
Module Type	K72S015M07
Duration (Hrs.)	18 Hours
Learning Outcomes	After completion of this module the trainee will be able to: - communicate ideas and information at the workplace effectively
Learning Content	Theory: • Active listening (paying close attention to what the other person is saying, asking clarifying questions, and rephrasing what the person says to ensure understanding) • Verbal and nonverbal communication • Follow instructions from supervisors and other relevant persons • Understand, interpret and applied information as required • Sharing work related information with other team members using industry terminology • Range of forms and formats related to work Duration-06 hrs

	Practical:
	• Role plays and dramas
	• Assignments
	    1. Prepare a list of 250-300 technical/vocational terms in English used in IT
	    2. Collect manufactures' guidelines/work instructions operation manuals related in IT, prepare a file and interpret the information
	
	Duration-12 hrs

Teaching-Learning activities	• Illustrated talk • Demonstrations • Individual practices • assignments
Forms of assessment	Formative Assessment + Summative Assessment

Module-08

Module Title	**Occupational literacy and numeracy**
Module Code	K72S015M08
Module Type	Basic Module
Duration (Hrs)	30 Hours
Learning Outcomes	After completion of this module the trainee will be able to: - Use basic computing mathematics to complete work tasks and solve Problems - Communicate ideas in writing - Read range of written materials
Learning Content	**Theory** • Decimal, Binary, hexa and octal numbers, • Number conversion • Key concepts and principles of mathematics • Key concepts and principles of basic Geometry Computation skills • vocabulary for everyday tasks • Written material to convey intended message in familiar work context • units, codes and symbols according to purpose of written material • vocabulary to read range of written materials according to workplace requirements • Information from text integrated with own knowledge in order to create meaning Duration – 24 hrs
	Practical • Calculate & convert decimal ,Binary, hexa and octal numbers • Computation with computer mathematics' • basic Geometry Computation • codes and symbols Duration -06 hrs
Teaching-Learning activities	• Illustrated talk • Video clips • Demonstrations
Forms of assessment	Formative Assessment + Summative Assessment

Module-09

Module -09	
Module Title	**Team Work**
Module Code	K72S015M09
Duration (Hrs)	18Hours
Module Type	Basic Module
Learning Outcomes	At the end of this module student should be able to; • Contribute positively to the work in team environment • Work effectively with others in a socially diverse environment • Respect and accept the views of others • Give, receive and act upon feedback • Identify and describe own roles and roles of others
Learning Content	Theory: • Simple concepts of team behavior • Elementary group dynamics • Basic knowledge in social and demographic structures Duration -06 hrs
	Practical • Identify and establish team purpose, team member's roles and responsibilities. • Coach and motivate team. • Assignments 1. Form a group for cleaning, machine maintenance, waste management and give the feedback on group effort 2. Arrange sports activities / social events Duration -12 hrs
Teaching-Learning activities	• Assignments • Lectures • role plays • case studies • team building activities • coaching and mentoring
Forms of assessment	Formative Assessment + Summative Assessment

Module-10

Module Title	**Occupational health and safety procedures in a workplace**
Module Code	K72S015M10
Module Type	Basic Module
Duration (Hrs)	18 Hours
Learning Outcomes	After completion of this module the trainee will be able to: - describe importance of safety -work safely in a work place
Learning Content	**Theory** • Importance of Safety and general Precautions to be observed in the workplace • Safety signs - for Danger, Warning, caution & personal safety message • Fire extinguishers used for Different types of fire. • Environment pollution, safe disposal waste • Safe handling and periodic testing • Proper use of Personnel Protecting Equipment (PPE) • Unsafe acts and conditions • Evacuation procedures and emergency protection area & fire exists • Types of hazards and hazards control practices and procedures • Manual handling procedures and ergonomic parameters • Accidents and incidents documentation • Safe disposal of waste • Energy Conservation Duration -12 hrs
	Practical • Use of Personnel Protective Equipment (PPE) • Maintenance and cleanliness of workplace • Demonstration on First aid • Fire safety and use of fire extinguishers. • Demonstration on safe handling and Periodic testing of lifting equipment, Energy saving Tips Duration - 06 hrs
Teaching-Learning activities	• Illustrated talk • Video clips • Demonstrations
Forms of assessment	Formative Assessment + Summative Assessment

Assessment Guide:

Forms of assessment

Assessment shall be based on evidence collected through workplace performance or a combination of evidence collected through training and work place performance.

Assessment context

This unit may be assessed on the job, off the job or a combination of on and off the job. The unit may be assessed individually.

Assessment conditions

The candidate will have access to:
- all tools, equipment, material and documentation required.

The candidate will be permitted to refer the following documents:
- material, paint and polish safety data sheets
- health and safety regulations
- product data sheet (PDS)
- company specification sheets
- manufacturer's instructional brochures and manuals

The candidate will be required to:
- orally or by other methods of communication, answer questions asked by the assessor.
- identify superiors and clients who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria and that he/she possess the required underpinning knowledge.

Special notes

During assessment, the candidate will;

- demonstrate safe work practices at all times
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment.
- perform all tasks in accordance with standard operating procedures.
- perform all tasks to specifications
- take responsibility for the accuracy of his/her own work
- use accepted methods for calculation.

Tasks involved will be completed within reasonable time frames relating to typical workplace activities.

Resources required for assessment

These include material, tools and equipment listed within this unit

**Tools, material and equipment require for the training program
(Approximately 15/20 students)**

No	Item	Quantity
1	Fire protection equipment	1:10
2	Colored tape and paint	1:20
3	PC with OS	20:20
4	UPS	20:20
5	PC without OS (for Installing Linux)	2:10
6	Scanner	1:20
7	Printer	1:20
8	Wireless Access point	2:10
9	Magnifying glass with lamp	2:20
10	Universal Liquid Cooling System For PC	1:20
11	Professional computer hardware tool kit	1:10
12	Assembly Workbenches	1:10
13	Anti-Static Wrist Strap	20:20
14	Anti-Static Mat	2:10
15	Hot gun with soldering iron(Trouble shooting purpose)	2:10
16	Multimeter (Trouble shooting purpose)	2:10
17	power on self-test card with user Manual (Trouble shooting purpose)	2:10
18	Soldering iron with Ceramic Bit(Trouble shooting purpose)	2:10
19	Hot Melt Glue Gun(Trouble shooting purpose)	2:10
20	De soldering pumps(Trouble shooting purpose)	2:10
21	laser soldering system BGA Rework Station(Trouble shooting purpose)	1:20
22	Digital Power Supply Test(Trouble shooting purpose)	2:10
23	Anti-Static Gloves	20:20
24	Blower	2:10
25	Hand Held Vacuum Cleaner	2:10
26	Internet Facility	1:20
27	Network Cable Tester Digital and Analog	2:10
28	Crimping Tools	4:10
29	Punch Down Tools	4:10
30	Wire Stripper	4:10
31	Corner Tool	4:10
32	Hilti drill	1:10
33	Tone Probe	2:10
34	Rack Mountable Server (for Windows)	1:20
35	Rack Mountable Server without OS (for Linux)	1:20
36	Server Rack((19", 32 U recommended)	1:20

37	Online UPS(1.2KVA recommended)	1:20
38	Cable Management Bar	1:10
39	Patch Panel (24 port recommended)	2:10
40	KVM Switch (four channel recommended)	1:20
41	4 Channel DVR with CCTV Camera(Complete pack)	1:10
42	4 Channel NVR with IP Camera(Complete pack)	1:10
43	Network Switch Unmanageable(24 port recommended)	1:10
44	Network Switch manageable24 port recommended)	1:10
45	~~ADSL~~ Router	1:10
46	Wireless Access Point	1:10
47	Mobile Device (iOS, Android, Windows)	2:10

ACKNOWLEDGMENT

- Mr. Lasantha M. Samaranayaka, Director Engineering, EAP Broadcasting Company Ltd.,No. 676, Galle Road, Colombo 03
- Mr. D.J.L. Perera, Managing Director / Engineer, Teltech Electronic Engineering Services, No.250, Galle Road, Colombo 04.
- Mr. K D R Perera, Chief Academic Officer, OpenArc Campus, No 87, Nawala Road, Nugegoda
- Mr. Sanjeewa Dannangoda Gamage, Chief Technology Officer, Asia Pacific Technology Systems (Pvt) Ltd,Level 26, World Trade Centre, Colombo 01.
- Dr. L.S.K. Udugama, Senior Lecturer, The Open University of Sri Lanka, Nawala, Nugegoda
- Mr. R.G. Manchanayake,Senior Lecturer, NIBM, No.120/5, Vidya Mawatha, Colombo 07.
- Ms. Rohini Chandralatha,Instructor, VTA, 354/2 Elvitigala Mawatha, Colombo
- Mr.M.M.Y.C.B.Bogamuwa, Lead systems engineer, Zone24x7 (Private) ltd, 460, Nawala Road, Koswatte
- Mrs. G.H.R.S.E. Silva, Factory Inspecting Engineer, Department of Labour
- Mr.Saman Wickramasinghe, Assistant Director, Tertiary and Vocational Education Commission, "Nipunatha Piyasa", Third Floor, 354/2, Elvitigala Mawatha, Colombo 05
- Ms.M.K.G.J.Roshani – Inspector (Standard Setting and Curriculum Development Section), National Apprentice & Industrial Training Authority, Rajagiriya

Occupational Outlook

Job Description

Computer Hardware and Network Technician is the widely known occupation of the ICT sector. The advancement and development of technology has upgraded the functions and processes involved in the job of ICT. The main tasks of Computer Hardware and Network Technician is to identify, support and installation of IT related activities.

Responsibilities

- Identify installation, configuration and ongoing usability of system hardware/network/ surveillance components and software
- Offer daily operations and systems support
- Verify functionality of hardware/network/ surveillance components and software components
- Troubleshoot hardware/network/ surveillance components and software issues in person, remotely and via phone
- Assist employees with computer problems and answer their questions
- Conduct daily network backup operations

Career paths include, but are not limited to:

- Hardware Technician
- Network Technician
- Hardware & Network Technician
- IT Technician
- IT Support Executive
- IT assistant

NATIONAL COMPETENCY STANDARDS AND COMPETENCY BASED TRAINING CURRICULUM FOR **Computer Hardware and Network Technician** **(Code: K72S015)**	
NATIONAL CERTIFICATE AT NVQ LEVEL 4 IN THE OCCUPATION OF COMPUTER HARDWARE AND NETWORK TECHNICIAN	
1. Endorsement date: 31.12.2019	**2.Date for review:31.12.2022**
3. Qualification code:	**K72S015Q1L4**
4. Purpose of the Qualification	To certify that the holder of this qualification has acquired the competencies contained in the units listed in section 6 below.
5. Regulations for the Qualification	The holder should have been assessed by a licensed assessor and found competent in the units listed in section 6 and certified by the TVEC
6. Qualification Packages	Included in the Page no. 8-9
7. Prerequisite	The candidate should have been found competent in "Basic Competencies to work" to be eligible for the award of this qualification. The candidate may concurrently apply for" Basic Competencies to Work "and this qualification.
8. Accreditation requirement	The qualifications shall be offered in compliance with the accreditation requirements of the TVEC as stipulated in the National Vocational Qualifications framework of Sri Lanka.
9. Certification	TVEC shall certify the qualifications in terms of the regulation at section 6 above.
10. Transition arrangements	The competency based assessments shall be undertaken by the registered assessors until TVEC arranges to issue licenses to the assessors
11.Requirement of Conducting Knowledge Assessment	Need to conduct common Knowledge Assessment
9. Assessment consistency requirements	TVEC is responsible for consistency of assessments shall take appropriate steps to ensure consistency of assessments
11. Contact for comments	Director General, Tertiary & Vocational Education Commission, 354/2, Nipunatha Piyasa, Elvitigala Mawatha, Colombo 05. Chairman, National Apprenticeship & Industrial Training Authority, 971, Sri Jayewardenepura Mawatha, Welikada, Rajagiriya.