

TRAINING REGULATIONS



BROADBAND INSTALLATION (FIXED WIRELESS SYSTEMS) NC II

INFORMATION AND COMMUNICATION
TECHNOLOGY (ICT) SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Superhighway, Taguig City, Metro Manila

TABLE OF CONTENTS

BROADBAND INSTALLATION (FIXED WIRELESS SYSTEMS)

NATIONAL CERTIFICATE LEVEL II

	Page No.
SECTION 1 BROADBAND INSTALLATION (FIXED WIRELESS SYSTEMS) NC II QUALIFICATION	1
SECTION 2 COMPETENCY STANDARDS	2-31
• Basic Competencies	2 -13
• Common Competencies	14 -19
• Core Competencies	20 -31
SECTION 3 TRAINING STANDARDS	32-38
SECTION 4 ASSESSMENT AND CERTIFICATION ARRANGEMENTS	39
DEFINITION OF TERMS	40-43
COMPETENCY MAP	44
ACKNOWLEDGEMENT	45

TRAINING REGULATIONS FOR BROADBAND INSTALLATION (FIXED WIRELESS SYSTEMS) NC II

Section 1 **BROADBAND INSTALLATION (FIXED WIRELESS SYSTEMS) NC II QUALIFICATION**

The **Broadband Installation (Fixed Wireless Systems) NC II** Qualification consists of competencies that a person must possess to install mast and accessories, lay out and install CAT5e cables and configure CPE as well as to render service excellence to customers.

This Qualification is packaged from the proposed competency map of the ICT Industry (Service Sector) shown in Annex A.

The units of competency comprising this qualification include the following:

Code	BASIC COMPETENCIES
500311105	Participate in workplace communication
500311106	Work in team environment
500311107	Practice career professionalism
500311108	Practice occupational health and safety procedures

Code	COMMON COMPETENCIES
ICT315202	Apply quality standards
ICT311203	Perform computer operations

Code	CORE COMPETENCIES
ICT724601	Install Mast and Accessories
ICT724602	Install and Lay Out Cables
ICT724603	Install and Configure CPE
ICT724604	Render Service Excellence to Customers

A person who has achieved this Qualification is competent to be a:

- Fixed Wireless Broadband Installer

Note: *Some employers may require their broadband installers to hold driver's licenses.*

SECTION 2: COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common, and core units of competency required for **Broadband Installation (Fixed Wireless Systems) NC II**.

BASIC COMPETENCIES

UNIT OF COMPETENCY : PARTICIPATE IN WORKPLACE COMMUNICATION

UNIT CODE : 500311105

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized</i> terms are elaborated in the Range of Variables
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from appropriate sources 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information 1.3 Appropriate medium is used to transfer information and ideas 1.4 Appropriate non-verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and storage of information are used 1.7 Personal interaction is carried out clearly and concisely
2. Participate in workplace meetings and discussions	2.1 Team meetings are attended on time 2.2 Own opinions are clearly expressed and those of others are listened to without interruption 2.3 Meeting inputs are consistent with the meeting purpose and established protocols 2.4 Workplace interactions are conducted in a courteous manner 2.5 Questions about simple routine workplace procedures and matters concerning working conditions of employment are asked and responded to 2.6 Meetings outcomes are interpreted and implemented
3. Complete relevant work related documents	3.1 Range of forms relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Basic mathematical processes are used for routine calculations 3.4 Errors in recording information on forms/ documents are identified and properly acted upon 3.5 Reporting requirements to supervisor are completed according to organizational guidelines

RANGE OF VARIABLES

VARIABLE	RANGE
1. Appropriate sources	1.1. Team members 1.2. Suppliers 1.3. Trade personnel 1.4. Local government 1.5. Industry bodies
2. Medium	2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information discussion 2.5. Follow-up or verbal instructions 2.6. Face to face communication
3. Storage	3.1. Manual filing system 3.2. Computer-based filing system
4. Forms	4.1. Personnel forms, telephone message forms, safety reports
5. Workplace interactions	5.1. Face to face 5.2. Telephone 5.3. Electronic and two way radio 5.4. Written including electronic, memos, instruction and forms, non-verbal including gestures, signals, signs and diagrams
6. Protocols	6.1. Observing meeting 6.2. Compliance with meeting decisions 6.3. Obeying meeting instructions

EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> 1.1. Prepared written communication following standard format of the organization 1.2. Accessed information using communication equipment 1.3. Made use of relevant terms as an aid to transfer information effectively 1.4. Conveyed information effectively adopting the formal or informal communication
<p>2. Underpinning Knowledge</p>	<ol style="list-style-type: none"> 2.1. Effective communication 2.2. Different modes of communication 2.3. Written communication 2.4. Organizational policies 2.5. Communication procedures and systems 2.6. Technology relevant to the enterprise and the individual's work responsibilities
<p>3. Underpinning Skills</p>	<ol style="list-style-type: none"> 3.1. Follow simple spoken language 3.2. Perform routine workplace duties following simple written notices 3.3. Participate in workplace meetings and discussions 3.4. Complete work related documents 3.5. Estimate, calculate and record routine workplace measures 3.6. Basic mathematical processes of addition, subtraction, division and multiplication 3.7. Ability to relate to people of social range in the workplace 3.8. Gather and provide information in response to workplace Requirements
<p>4. Resource Implications</p>	<ol style="list-style-type: none"> 4.1. Fax machine 4.2. Telephone 4.3. Writing materials 4.4. Internet
<p>5. Methods of Assessment</p>	<ol style="list-style-type: none"> 5.1. Direct Observation 5.2. Oral interview 5.3. Written test
<p>6. Context for Assessment</p>	<ol style="list-style-type: none"> 6.1. Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY: WORK IN TEAM ENVIRONMENT

UNIT CODE : 500311106

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes to identify the participant's roles and responsibilities as a member of a team.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized</i> terms are elaborated in the Range of Variables
1. Describe team role and scope	1.1. The role and objective of the team is identified from available sources of information 1.2. Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources
2. Identify own role and responsibility within team	2.1. Individual role and responsibilities within the team environment are identified 2.2. Roles and responsibility of other team members are identified and recognized 2.3. Reporting relationships within team and external to team are identified
3. Work as a team member	3.1. Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives 3.2. Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and workplace context 3.3. Observed protocols in reporting using standard operating procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of the team	1.1. Work activities in a team environment with enterprise or specific sector 1.2. Limited discretion, initiative and judgement maybe demonstrated on the job, either individually or in a team environment
2. Sources of information	2.1. Standard operating and/or other workplace procedures 2.2. Job procedures 2.3. Quality standards 2.4. OHS and environmental standards
3. Workplace context	3.1. Work procedures and practices 3.2. Conditions of work environments 3.3. Legislation and industrial agreements 3.4. Standard work practice including the storage, safe handling and disposal of chemicals 3.5. Safety, environmental, housekeeping and quality guidelines

EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> 1.1. Operated in a team to complete workplace activity 1.2. Worked effectively with others 1.3. Conveyed information in written or oral form 1.4. Selected and used appropriate workplace language 1.5. Followed designated work plan for the job 1.6. Reported outcomes
<p>2. Underpinning Knowledge and Attitude</p>	<ol style="list-style-type: none"> 2.1. Communication process 2.2. Team structure 2.3. Team roles 2.4. Group planning and decision making
<p>3. Underpinning Skills</p>	<ol style="list-style-type: none"> 3.1. Communicate appropriately, consistent with the culture of the workplace
<p>4. Resource Implications</p>	<p>The following resources MUST be provided:</p> <ol style="list-style-type: none"> 4.1. Access to relevant workplace or appropriately simulated environment where assessment can take place 4.2. Materials relevant to the proposed activity or tasks
<p>5. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ol style="list-style-type: none"> 5.1. Observation of the individual member in relation to the work activities of the group 5.2. Observation of simulation and/ or role play involving the participation of the individual member to the attainment of organizational goals
<p>6. Context for Assessment</p>	<ol style="list-style-type: none"> 6.1. Competency may be assessed in the workplace or in a simulated workplace setting 6.2. Assessment shall be observed while tasks are being undertaken whether individually or in a group

UNIT OF COMPETENCY: PRACTICE CAREER PROFESSIONALISM

UNIT CODE : 500311107

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in promoting career growth and advancement.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized</i> terms are elaborated in the Range of Variables
1. Integrate personal objectives with organizational goals	1.1. Personal growth and work plans are pursued towards improving the qualifications set for the profession 1.2. Intra- and interpersonal relationships are maintained in the course of managing oneself based on performance evaluation 1.3. Commitment to the organization and its goal is demonstrated in the performance of duties
2. Set and meet work priorities	2.1. Competing demands are prioritized to achieve personal, team and organizational goals and objectives. 2.2. Resources are utilized efficiently and effectively to manage work priorities and commitments 2.3. Practices along economic use and maintenance of equipment and facilities are followed as per established procedures
3. Maintain professional growth and development	3.1. Trainings and career opportunities are identified and availed of based on job requirements 3.2. Recognitions are -sought/received and demonstrated as proof of career advancement 3.3. Licenses and/or certifications relevant to job and career are obtained and renewed

RANGE OF VARIABLES

VARIABLE	RANGE
1. Evaluation	1.1 Performance Appraisal 1.2 Psychological Profile 1.3 Aptitude Tests
2. Resources	2.1 Human 2.2 Financial 2.3 Technology 2.3.1 Hardware 2.3.2 Software
3. Trainings and career opportunities	3.1 Participation in training programs 3.1.1 Technical 3.1.2 Supervisory 3.1.3 Managerial 3.1.4 Continuing Education 3.2 Serving as Resource Persons in conferences and workshops
4. Recognitions	4.1 Recommendations 4.2 Citations 4.3 Certificate of Appreciations 4.4 Commendations 4.5 Awards 4.6 Tangible and Intangible Rewards
5. Licenses and/or certifications	5.1 National Certificates 5.2 Certificate of Competency 5.3 Support Level Licenses 5.4 Professional Licenses

EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Attained job targets within key result areas (KRAs) 1.2 Maintained intra - and interpersonal relationship in the course of managing oneself based on performance evaluation 1.3 Completed trainings and career opportunities which are based on the requirements of the industries 1.4 Acquired and maintained licenses and/or certifications according to the requirement of the qualification
<p>2. Underpinning Knowledge</p>	<ul style="list-style-type: none"> 2.1 Work values and ethics (Code of Conduct, Code of Ethics, etc.) 2.2 Company policies 2.3 Company-operations, procedures and standards 2.4 Fundamental rights at work including gender sensitivity 2.5 Personal hygiene practices
<p>3. Underpinning Skills</p>	<ul style="list-style-type: none"> 3.1 Appropriate practice of personal hygiene 3.2 Intra and Interpersonal skills 3.3 Communication skills
<p>4. Resource Implications</p>	<p>The following resources MUST be provided:</p> <ul style="list-style-type: none"> 4.1 Workplace or assessment location 4.2 Case studies/scenarios
<p>5. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 5.1 Portfolio Assessment 5.2 Interview 5.3 Simulation/Role-plays 5.4 Observation 5.5 Third Party Reports 5.6 Exams and Tests
<p>6. Context for Assessment</p>	<ul style="list-style-type: none"> 6.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : PRACTICE OCCUPATIONAL HEALTH AND SAFETY PROCEDURES

UNIT CODE : 500311108

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to comply with regulatory and organizational requirements for occupational health and safety.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized</i> terms are elaborated in the Range of Variables
1. Identify hazards and risks	1.1 Safety regulations and workplace safety and hazard control practices and procedures are clarified and explained based on organizational procedures 1.2 Hazards/risks in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment in accordance with organizational procedures 1.3 Contingency measures during workplace accidents, fire and other emergencies are recognized and established in accordance with organization procedures
2. Evaluate hazards and risks	2.1 Terms of maximum tolerable limits which when exceeded will result in harm or damage are identified based on threshold limit values (TLV) 2.2 Effects of the hazards are determined 2.3 OHS issues and/or concerns and identified safety hazards are reported to designated personnel in accordance with workplace requirements and relevant workplace OHS legislation
3. Control hazards and risks	3.1 Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed 3.2 Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies 3.3 Personal protective equipment (PPE) is correctly used in accordance with organization OHS procedures and practices 3.4 Appropriate assistance is provided in the event of a workplace emergency in accordance with established organization protocol
4. Maintain OHS awareness	4.1 Emergency-related drills and trainings are participated in as per established organization guidelines and procedures 4.2 OHS personal records are completed and updated in accordance with workplace requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Safety regulations	May include but are not limited to: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Philippine Occupational Safety and Health Standards 1.6 DOLE regulations on safety legal requirements 1.7 ECC regulations
2. Hazards/Risks	May include but are not limited to: 2.1 Physical hazards – impact, illumination, pressure, noise, vibration, temperature, radiation 2.2 Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects 2.3 Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 2.4 Ergonomics 2.4.1 Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles 2.4.2 Physiological factors – monotony, personal relationship, work out cycle
3. Contingency measures	May include but are not limited to: 3.1 Evacuation 3.2 Isolation 3.3 Decontamination 3.4 (Calling designed) emergency personnel
4. Personal Protective Equipment	May include but are not limited to: 4.1 body belt & strap 4.2 hard hat/ helmet 4.3 set gloves 4.4 goggles 4.5 safety shoes 4.6 tool pouch
5. Emergency-related drills and training	5.1 Fire drill 5.2 Earthquake drill 5.3 Basic life support/CPR 5.4 First aid 5.5 Spillage control 5.6 Decontamination of chemical and toxic 5.7 Disaster preparedness/management
6. OHS personal records	6.1 Medical/Health records 6.2 Incident reports 6.3 Accident reports 6.4 OHS-related training completed

EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Explained clearly established workplace safety and hazard control practices and procedures 1.2 Identified hazards/risks in the workplace and its corresponding indicators in accordance with company procedures 1.3 Recognized contingency measures during workplace accidents, fire and other emergencies 1.4 Identified terms of maximum tolerable limits based on threshold limit value- TLV. 1.5 Followed Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace 1.6 Used Personal Protective Equipment (PPE) in accordance with company OHS procedures and practices 1.7 Completed and updated OHS personal records in accordance with workplace requirements
<p>2. Underpinning Knowledge</p>	<ul style="list-style-type: none"> 2.1 OHS procedures and practices and regulations 2.2 PPE types and uses 2.3 Personal hygiene practices 2.4 Hazards/risks identification and control 2.5 Threshold Limit Value -TLV 2.6 OHS indicators 2.7 Organization safety and health protocol 2.8 Safety consciousness 2.9 Health consciousness
<p>3. Underpinning Skills</p>	<ul style="list-style-type: none"> 3.1 Practice of personal hygiene 3.1 Hazards/risks identification and control skills 3.2 Interpersonal skills 3.4 Communication skills
<p>4. Resource Implications</p>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 4.1 Workplace or assessment location 4.2 OHS personal records 4.3 PPE 4.4 Health records
<p>5. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 5.1 Portfolio Assessment 5.2 Interview 5.3 Case Study/Situation
<p>6. Context for Assessment</p>	<ul style="list-style-type: none"> 6.1 Competency may be assessed in the work place or in a simulated work place setting

COMMON COMPETENCIES

UNIT TITLE : **APPLY QUALITY STANDARDS**

UNIT CODE : **ICT315202**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes needed to apply quality standards in the workplace. The unit also includes the application of relevant safety procedures and regulations, organization procedures and customer requirements

ELEMENT	PERFORMANCE CRITERIA
	<i>Italicized Bold</i> terms are elaborated in the Range of Variables
1. Assess quality of received materials or components	1.1. Work instructions are obtained and work is carried out in accordance with standard operating procedures 1.2. Received materials or component parts are checked against workplace standards and specifications 1.3. Faulty material or components related to work are identified and isolated 1.4. Faults and any identified causes are recorded and/or reported to the supervisor concerned in accordance with workplace procedures 1.5. Faulty materials or components are replaced in accordance with workplace procedures
2. Assess own work	2.1. Documentation relative to quality within the company is identified and used 2.2. Completed work is checked against workplace standards relevant to the task undertaken 2.3. Faulty pieces are identified and isolated 2.4. Information on the quality and other indicators of production performance is recorded in accordance with workplace procedures 2.5. Deviations from specified quality standards , causes are documented and reported in accordance with the workplace standards operating procedures
3. Engage in quality improvement	3.1. Process improvement procedures are participated in relation to workplace assignment 3.2. Work is carried out in accordance with process improvement procedures 3.3. Performance of operation or quality of product or service to ensure customer satisfaction is monitored

RANGE OF VARIABLES

VARIABLE	RANGE
1. Materials/components	1.1. Materials may include but not limited to: 1.1.1. Wires 1.1.2. Cables, soldering lead 1.1.3. Electrical tape 1.2. Components may include but not limited to: 1.2.1. ICs 1.2.2. Diodes
2. Faults	Faults may include but not limited to: 2.1. Components/materials not according to specification 2.2. Components/materials contain manufacturing defects 2.3. Components/materials do not conform with government regulation i.e., PEC, environmental code 2.4. Components/materials have safety defect
3. Documentation	3.1. Organization work procedures 3.2. Manufacturer's instruction manual 3.3. Customer requirements 3.4. Forms
4. Quality standards	4.1. Quality standards may relate but not limited to the following: 4.1.1. Materials 4.1.2. Component parts 4.1.3. Final product 4.1.4. Production processes
5. Customer	5.1. Co-worker 5.2. Suppliers 5.3. Client 5.4. Organization receiving the product or service

EVIDENCE GUIDE

1. Critical aspect of competency	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> 1.1. Carried out work in accordance with the company's standard operating procedures 1.2. Performed task according to specifications 1.3. Reported defects detected in accordance with standard operating procedures 1.4. Carried out work in accordance with the process improvement procedures
2. Underpinning knowledge	<ol style="list-style-type: none"> 2.1. Relevant production processes, materials and products 2.2. Characteristics of materials/component parts used in electronic production processes 2.3. Quality checking procedures 2.4. Workplace procedures 2.5. Safety and environmental aspects of production processes 2.6. Fault identification and reporting 2.7. Quality improvement process
3. Underpinning skills	<ol style="list-style-type: none"> 3.1. Reading skills required to interpret work instruction 3.2. Communication skills needed to interpret and apply defined work procedures 3.3. Carry out work in accordance with OHS policies and procedures
4. Method of assessment	<ol style="list-style-type: none"> 4.1. The assessor may select at least two (2) of the following assessment methods to objectively assess the candidate: <ol style="list-style-type: none"> 4.1.1. Observation 4.1.2. Questioning 4.1.3. Practical demonstration
5. Resource implication	<ol style="list-style-type: none"> 5.1. Materials and component parts and equipment to be used in a real or simulated electronic production situation
6. Context of Assessment	<ol style="list-style-type: none"> 6.1. Assessment may be conducted in the workplace or in a simulated work environment.

UNIT OF COMPETENCY: PERFORM COMPUTER OPERATIONS**UNIT CODE : ICT311203****UNIT DESCRIPTOR** : This unit covers the knowledge, skills, (and) attitudes and values needed to perform computer operations which include inputting, accessing, producing and transferring data using the appropriate hardware and software

ELEMENT	PERFORMANCE CRITERIA <i>Italicized Bold</i> terms are elaborated in the Range of Variables
1. Plan and prepare for task to be undertaken	1.1. Requirements of the task are determined according to job specifications 1.2. Appropriate hardware and software are selected according to the tasks assigned and their required outcomes 1.3. Task is planned to ensure OH & S guidelines and procedures are followed
2. Input data into computer	2.1. Data are entered into the computer using appropriate program/application in accordance with company procedures 2.2. Accuracy of information is checked and information is saved in accordance with standard operating procedures 2.3. Inputted data are stored in storage media according to requirements 2.4. Work is performed within ergonomic guidelines
3. Access information using computer	3.1. Correct program/application is selected based on job requirements 3.2. Program/application containing the information required is accessed according to company procedures 3.3. Desktop icons are correctly selected, opened and closed for navigation purposes 3.4. Keyboard techniques are carried out in line with OH & S requirements for safe use of keyboards
4. Produce/output data using computer system	4.1. Entered data are processed using appropriate software commands 4.2. Data printed out as required using computer hardware/peripheral devices in accordance with standard operating procedures 4.3. Files, data are transferred between compatible systems using computer software, hardware/ peripheral devices in accordance with standard operating procedures
5. Maintain computer equipment and systems	5.1. Systems for cleaning, minor maintenance and replacement of consumables are implemented 5.2. Procedures for ensuring security of data, including regular back-ups and virus checks are implemented in accordance with standard operating procedures 5.3. Basic file maintenance procedures are implemented in line with the standard operating procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Hardware and peripheral devices	1.1. Personal computers 1.2. Networked systems 1.3. Communication equipment 1.4. Printers 1.5. Scanners 1.6. Keyboard 1.7. Mouse
2. Software	Software include the following but not limited to: 2.1. Word processing packages 2.2. Data base packages 2.3. Internet 2.4. Spreadsheets
3. OH & S guidelines	3.1. OHS guidelines 3.2. Enterprise procedures
4. Storage media	Storage media include the following but not limited to: 4.1. Diskettes 4.2. CDs 4.3. zip disks 4.4. Hard disk drives, local and remote
5. Ergonomic guidelines	5.1. Types of equipment used 5.2. Appropriate furniture 5.3. Seating posture 5.4. Lifting posture 5.5. Visual display unit screen brightness
6. Desktop icons	Icons include the following but not limited to: 6.1. Directories/folders 6.2. Files 6.3. Network devices 6.4. Recycle bin
7. Maintenance	7.1. Creating more space in the hard disk 7.2. Reviewing programs 7.3. Deleting unwanted files 7.4. Backing up files 7.5. Checking hard drive for errors 7.6. Using up to date anti-virus programs 7.7. Cleaning dust from internal and external surfaces

EVIDENCE GUIDE

<p>1. Critical aspect of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> 1.1. Selected and used hardware components correctly and according to the task requirement 1.2. Identified and explained the functions of both hardware and software used, their general features and capabilities 1.3. Produced accurate and complete data in accordance with the requirements 1.4. Used appropriate devices and procedures to transfer files/data accurately 1.5. Maintained computer system
<p>2. Underpinning knowledge</p>	<ol style="list-style-type: none"> 2.1. Basic ergonomics of keyboard and computer use 2.2. Main types of computers and basic features of different operating systems 2.3. Main parts of a computer 2.4. Storage devices and basic categories of memory 2.5. Relevant types of software 2.6. General security 2.7. Viruses 2.8. OH & S principles and responsibilities 2.9. Calculating computer capacity
<p>3. Underpinning skills</p>	<ol style="list-style-type: none"> 3.1. Reading skills required to interpret work instruction
<p>4. Method of assessment</p>	<ol style="list-style-type: none"> 4.1. The assessor may select at least two of the following assessment methods to objectively assess the candidate: <ol style="list-style-type: none"> 4.1.1. Observation 4.1.2. Questioning 4.1.3. Practical demonstration
<p>5. Resource implication</p>	<ol style="list-style-type: none"> 5.1. Computer hardware with peripherals 5.2. Appropriate software
<p>6. Context of Assessment</p>	<ol style="list-style-type: none"> 6.1. Assessment may be conducted in the workplace or in a simulated work environment

CORE COMPETENCIES

UNIT OF COMPETENCY : INSTALL MAST AND ACCESSORIES

UNIT CODE : ICT724601

DESCRIPTOR : This unit covers the outcomes required for installing mast and accessories. This involves working with a team.

ELEMENT	PERFORMANCE CRITERIA <i>(Italicized Bold terms are elaborated in the range of variables)</i>
1. Prepare for mast installation	1.1 Necessary tools, materials and personal protective equipment (PPE) are prepared in line with job requirements. 1.2 Information on proposed locations and necessary approvals from relevant authorities is obtained. 1.3 Site is cleared and prepared to provide unrestricted access for installation works in accordance with joint pole agreement 1.4 Installation constraints and safety hazards are identified and suitable action determined
2. Install mast, accessories	2.1 Tools, equipment, clothing and safety requirements are identified and obtained for the installation. 2.2 Tools and equipment are checked to be in good working order and adjusted to manufacturers' specifications 2.3 Fixing structures and devices on mast are installed securely in accordance with company's specifications 2.4 Identifier marks are placed on installed mast for identification 2.5 Guy-wire assembly is installed and tensioned to required specifications 2.6 Problems encountered are referred to appropriate personnel as per standard operating procedures (SOP). 2.7 Installation and design amendments are reported/ documented in accordance with job requirements

RANGE OF VARIABLES

VARIABLE	RANGE	
1. Tools and equipment, materials and PPE	May include but not limited to: Tools and equipment: 1.1 set of wrenches 1.2 set of pliers 1.3 extension ladder 1.4 set of hammer 1.5 set of ropes 1.6 electric drill with different bits of various sizes Materials: 1.7 set of guy grips/clips 1.8 set of guy anchors/ribbons 1.9 turnbuckle 1.10 tie wrap 1.11 sets of washer, bolts and nuts 1.12 guy wire 1.13 rubber cap	1.14 machine bolts 1.15 wall-mount brackets 1.16 roof-mount bracket PPE: 1.17 body belt & strap 1.18 hard hat/ helmet 1.19 set gloves 1.20 goggles 1.21 safety shoes 1.22 tool pouch
2. Relevant authorities	2.1 homeowner's association 2.2 house owners 2.3 building administrators 2.4 apartment lessor	
3. Fixing structures and devices	3.1 Fixing structures 3.1.1. Guy wire 3.1.2. Guy ribbon 3.1.3. Guy anchor 3.1.4. Turnbuckle 3.2 Fixing devices 3.2.1. screw hooks 3.2.2. set of bolts, nuts and washers 3.2.3. machine bolts – straight 3.2.4. tex screws 3.2.5. wallmount / roofmount brackets 3.2.6. Color coded tapes (Serves as an identifier of Company/Installer)	
4. Types of installation	4.1 Roof-mounted 4.2 Wall-mounted 4.3 Special or customized installation	
5. Appropriate personnel	5.1 leadman/team leader 5.2 supervisor	
6. Installation and design amendments	6.1 cable re-routing 6.2 as-built plan	

EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> 1.1. Complied with job requirements and safety procedures at all times during installation 1.2. Installed mast, accessories and cables following job requirements and within agreed time frame 1.3. Communicated and worked with authorities and personnel concerned
2. Underpinning knowledge and attitude	<ol style="list-style-type: none"> 2.1 Safety Practices <ol style="list-style-type: none"> 1.1.1 Work safety requirements 1.1.2 Proper use of tools and equipment 2.2 Materials, Tools and Equipment: Uses and Specifications <ol style="list-style-type: none"> 2.2.1 Identification of appropriate tools, equipment; and devices 2.3 Theory and Practices <ol style="list-style-type: none"> 2.2.1 Installation of mast and accessories 2.2.2 Proper guy installation and tensioning 2.2.3 Type and size of mast per given height 2.3 Desirable work values and attitudes (cost conscious, safety conscious, quality conscious, etc.)
3. Underpinning skills	<ol style="list-style-type: none"> 3.1. Work efficiently and systematically 3.2. Observing safety precautions 3.3. Proper handling and positioning of extension ladder 3.4. Proper handling, use and maintenance of tools and equipment 3.5. Communicate effectively 3.6. Interpretation of plans and symbols 3.7. Documentation skills
4. Resource implications	<p>The following resources should be available:</p> <ol style="list-style-type: none"> 4.1. Tools, equipment, materials and PPE (see range of variables) 4.2. Work area 4.3. Service vehicle and traffic safety equipment
5. Method of assessment	<ol style="list-style-type: none"> 5.1. Direct observation with oral questioning 5.2. Portfolio 5.3. Third Party Report 5.4. Demonstration with oral questioning 5.5. Written test
6. Context of assessment	<ol style="list-style-type: none"> 6.1. Competency maybe assessed in the workplace or in a simulated workplace setting 6.2. Assessment shall be undertaken either individually or part of team under limited supervision

UNIT OF COMPETENCY : INSTALL AND LAY OUT CABLES

UNIT CODE : ICT724602

DESCRIPTOR : This unit covers the outcomes required for installing and laying out cables. Cable types are UTP, FTP and grounding cable. This involves working with a team.

ELEMENT	PERFORMANCE CRITERIA <i>(Italicized Bold terms are elaborated in the range of variables)</i>
1. Prepare for cable lay out and installation	1.1. Necessary tools, equipment, materials and personal protective equipment (PPE) are prepared in line with job requirements. 1.2. Cable lay out and installation requirements and constraints from plan and site inspection are identified as per job requirements 1.3. Cable lay out and installation equipment is set up in accordance with company and job requirements 1.4. Site is made safe and secure for cable installation 1.5. Suitable protective clothing is selected and required safety devices used 1.6. Support structure is assessed as safe for normal working conditions 1.7. Support structure is assessed to be sound for cable support as per job requirements 1.8. Cable route is checked for obstructions and are made clear using suitable methods and in coordination with authorities concerned. 1.9. Where necessary, obstructing cables, lines and pole attachments of other carriers are requested to be fixed or corrected to facilitate work of laying out and installing new cables
2. Lay out and Install cable	2.1 Tools, equipment, clothing and safety requirements are identified and obtained for the lay out and installation. 2.2 Cable is laid out and installed to required specifications 2.3 Cable is secured permanently to support structure in accordance with standard installation procedures 2.4 Bending radius tolerance is observed for cable materials at all times 2.5 Problems encountered are referred to appropriate personnel as per standard operating procedures (SOP).

RANGE OF VARIABLES

VARIABLE	RANGE	
1. Tools, equipment and materials and PPE	<p>May include but not limited to:</p> <p>Tools and Equipment:</p> <ul style="list-style-type: none"> 1.1 hammers 1.2 extension ladders (12 ft. length) 1.3 adjustable wrench 1.4 fixing brackets/clamps 1.5 drill/electric drill 1.6 tape linen/steel tape 1.7 RJ45 crimper <p>Materials:</p> <ul style="list-style-type: none"> 1.8 grounding wire 1.9 cable support 1.10 grounding rod 1.11 tie wrap 1.12 terminal lug 	<p>Materials for STP/UTP:</p> <ul style="list-style-type: none"> 1.13 RJ45 connectors (shielded) 1.14 RJ45 connectors (non-shielded) <p>PPE:</p> <ul style="list-style-type: none"> 1.15 body belt & strap 1.16 hard hat/ helmet 1.17 set gloves 1.18 goggles 1.19 safety shoes 1.20 tool pouch 1.21 safety cones/traffic safety devices
2. Support structure	<ul style="list-style-type: none"> 2.1 Roof 2.2 Ceiling 2.3 Pole 	
3. Suitable methods of cable routing	<ul style="list-style-type: none"> 3.1 Drilling of holes for cable entry/exit 3.2 Rerouting of cables to nearest possible cable entry/exit points 	
4. Appropriate personnel	<ul style="list-style-type: none"> 4.1 Leadman/team leader 4.2 Supervisor 	

EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> .1. Complied with standard installation practices and safety procedures at all times during installation .2. Laid out and installed data cables following job and quality requirements and within agreed time frame .3. Communicated and worked with authorities and personnel concerned
<p>2. Underpinning knowledge and attitude</p>	<ol style="list-style-type: none"> 2.1 Safety Practices <ol style="list-style-type: none"> 1.1.3 Work safety requirements 1.1.4 Proper use of tools and equipment 2.2 Materials, Tools and Equipment: Uses and Specifications <ol style="list-style-type: none"> 2.3.1 Identification of appropriate tools, equipment; and devices and proper usage 2.3 Theory and Practices <ol style="list-style-type: none"> 2.3.1 Wireless Broadband systems overview 2.3.2 Map reading and identification of network symbols and diagrams 2.3.3 Lay out and installation of CAT5e 2.3.4 Installation pole hardware and accessories 2.4 Desirable work values and attitudes (cost conscious, safety conscious, quality conscious, etc.)
<p>3. Underpinning skills</p>	<ol style="list-style-type: none"> 3.1. Work efficiently and systematically 3.2. Observing safety precautions 3.3. Proper handling, use and maintenance of tools and equipment. 3.4. Proper handling of CAT5e cables 3.5. Interpreting plans and symbols
<p>4. Resource implications</p>	<p>The following resources should be available:</p> <ol style="list-style-type: none"> 4.1. Tools, equipment, materials and PPE (see range of variables) 4.2. Service vehicle and traffic safety devices
<p>5. Method of assessment</p>	<ol style="list-style-type: none"> 5.1. Direct observation with oral questioning 5.2. Portfolio 5.3. Third Party Report 5.4. Demonstration with oral questioning 5.5. Written test
<p>6. Context of assessment</p>	<ol style="list-style-type: none"> 6.1. Competency maybe assessed in the workplace or in a simulated workplace setting 6.2. Assessment shall be undertaken either individually or part of team under limited supervision

UNIT OF COMPETENCY : INSTALL AND CONFIGURE CPE

UNIT CODE : ICT724603

DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to install the customer premise equipment (CPE) specifically for fixed wireless applications.

ELEMENT	PERFORMANCE CRITERIA <i>(Italicized Bold terms are elaborated in the range of variables)</i>
1. Prepare for installation of CPE	1.1 Job order and other documentation are received and interpreted in accordance with enterprise procedures 1.2 Necessary tools, equipment, materials and personal protective equipment (PPE) are identified and prepared in line with job requirements. 1.3 Verify line of sight (LOS) from customer premise towards nearest Base Transceiver Station (BTS)
2. Install CPE	2.1 Installation plan is read and interpreted as per job requirements 2.2 CPE is installed and configured in accordance with standard industry practices and ensuring safety procedures are followed. 2.3 Problems encountered are referred to appropriate personnel as per standard operating procedures (SOP). 2.4 Installation is properly documented according to SOP.
3. Connect CPE devices	3.1 Interconnecting cables are prepared and terminated between CPE and Equipment in accordance to installation manual 3.2 CPE are tested and adjusted in accordance with the company's installers manual 3.3 Problems encountered are referred to appropriate personnel as per standard operating procedures (SOP).
4. Configure CPE	4.1 Cable is interconnected to network interface card according to SOP. 4.2 Connection is configured according to company's application software. 4.3 Internet connection is tested and confirmed by client/customer. 4.4 Problems encountered are referred to appropriate personnel as per standard operating procedures (SOP).
5. Wrap up job	5.1 Tools, equipment and materials are gathered and stored back to the service vehicle 5.2 Waste and debris are removed from work place and disposed off in accordance with government regulations and environmental requirements 5.3 Changes made are restored to the work area during installation, disconnection and reconnection to the customer's satisfaction

RANGE OF VARIABLES

VARIABLE	RANGE	
1. Tools, equipment, materials and PPE	<p>May include but not limited to:</p> <p>Tools:</p> <ul style="list-style-type: none"> 1.1 RJ45 crimper 1.2 Blade cutter 1.3 Staple gun 1.4 Set of pliers 1.5 Set of screwdrivers 1.6 Hand drill w/ bits 1.7 Hammer 1.8 Mallet 1.9 compass 1.10 Extension ladders (12 feet length) <p>Materials:</p> <ul style="list-style-type: none"> 1.11 cable tie 1.12 sealant 1.13 cable tag 1.14 grounding wire (2.0mm, stranded) 1.15 grounding rod (1/2" by 20" with clamp) 1.16 surge suppressor 	<p>Customer Premise Equipment:</p> <ul style="list-style-type: none"> 1.17 radio antenna <p>Equipment:</p> <ul style="list-style-type: none"> 1.18 computer with NIC 1.19 surge suppressor 1.20 service vehicle <p>PPE:</p> <ul style="list-style-type: none"> 1.21 body belt & strap 1.22 hard hat/ helmet 1.23 set gloves 1.24 goggles 1.25 safety shoes 1.26 tool pouch / holster 1.27 safety cones/traffic safety devices
2. Installation and configuration of CPE	<ul style="list-style-type: none"> 2.1 Configure CPE 2.2 Conduct radio frequency (RF) survey 2.3 Check strength of received signal 2.4 Fix CPE to pole 2.5 Secure mounting 2.6 Layout cable 2.7 Provide drip loop and attach the cable properly to the wall of the building either through conduit or staple wire 2.8 Install surge suppressor nearest to ground and provide drip loop before inserting the cable inside the premise 2.9 Extend drop cable to computer 	
3. Equipment	<ul style="list-style-type: none"> 3.1 surge suppressor 3.2 personal computer/laptop with network-interface card 	
4. Appropriate personnel	<ul style="list-style-type: none"> 4.1 cable installer / lead man 4.2 ground man / helper 	
5. Problems encountered	<ul style="list-style-type: none"> 5.1 For CPE connections <ul style="list-style-type: none"> 5.1.1. failure of equipment / factory defects 5.1.2. incompatibility of CPE standards 5.1.3. power failure/interruptions 5.2 For CPE configuration <ul style="list-style-type: none"> 5.2.1. defective browser 5.2.2. viruses 5.2.3. firewall settings 5.2.4. network problem 	

EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Complied with standard industry practices and safety procedures at all times during implementation 1.2 Installed and configured Customer Premise Equipment (CPE) following quality procedures and industry standards 1.3 Demonstrated professionalism and interpersonal skills in dealing with subscriber concerns
<p>2. Underpinning knowledge and attitude</p>	<ul style="list-style-type: none"> 2.1 Safety Practices <ul style="list-style-type: none"> 2.1.1 Work safety requirements 2.1.2 Proper handling and use of tools and equipment 2.2 Materials, Tools and Equipment: Uses and Specifications <ul style="list-style-type: none"> 2.2.1 Identification of appropriate tools, equipment; and devices and proper usage 2.3 Theory and Practices <ul style="list-style-type: none"> 2.3.1 Communication Systems overview 2.3.2 Wireless Broadband Technology overview 2.3.3 Basic Computing 2.3.4 Map reading and identification of network symbols and diagrams 2.3.5 Lay out and installation of CAT5e 2.3.6 Installation pole hardware and accessories 2.4 Desirable work values and attitudes (cost conscious, safety conscious, quality conscious, etc.) 2.5 Adheres to guidelines on proper customer interface and customer service standards
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> 3.1 Work efficiently and systematically 3.2 Observing safety precautions and procedures 3.3 Map reading skills 3.4 Fixed Wireless Broadband Overview 3.5 Proper handling of tools, equipment and proper maintenance. 3.6 Communicating effectively (both oral and written) 3.7 Interpreting plans and diagrams
<p>4. Resource implications</p>	<p>The following resources must be available:</p> <ul style="list-style-type: none"> 4.1 Tools and test instruments and PPE (see range of variables) 4.2 Work area with radio service coverage for subscriber 4.3 Extension ladder 4.4 Service vehicle
<p>5. Method of assessment</p>	<ul style="list-style-type: none"> 5.1 Direct observation with questioning 5.2 Portfolio 5.3 Third Party Report 5.4 Demonstration with oral questioning 5.5 Written test
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> 6.1 Competency may be assessed in the workplace or in a simulated workplace setting 6.2 Assessment shall be undertaken either individually or part of team under limited supervision

UNIT OF COMPETENCY : RENDER SERVICE EXCELLENCE TO CUSTOMERS

UNIT CODE : ICT724604

DESCRIPTOR : This unit covers the knowledge, skills and attitude to conduct effective and efficient customer interactions.

ELEMENT	PERFORMANCE CRITERIA <i>(Italicized Bold terms are elaborated in the range of variables)</i>
1. Identify customer needs	1.1 Basic products and services catered to customers are identified
2. Conduct effective and efficient customer interactions	2.1 Guidelines on proper customer interface is adhered in accordance with the client/customer needs 2.2 Interactive communication is used in accordance with customer relationship management 2.3 Customer's inquiries/concerns are identified, responded and resolved 2.4 Courtesy is provided to the customer in accordance with customer relationship management 2.5 Proper grooming is maintained at all times.
3. Handle customer complaints	3.1 Nature and details of the complaint are established and appropriate actions are taken 3.2 Key principles and steps to retention in handling difficult customers is applied.
4. Provide after-sales support	4.1 Follow-up action is made to ensure that agreements with customers are implemented 4.2 Complaints are resolved and actions are taken in accordance with the agreements made with the customers 4.3 Full documentation of actions taken and resolutions agreed with the customers are done

RANGE OF VARIABLES

VARIABLE	RANGE
1. Client/customer's needs	May include the following: 1.1 Handling customers' personal needs 1.2 Handling customers' practical needs
2. Products and services	Includes the following but not limited to: 2.1. Technical support 2.2. Sales support
3. Interactive Communication	3.1 Gathering information in a courteous, professional manner 3.2 Active listening 3.3 Probing skills 3.3.1 paraphrasing 3.3.2 summarizing 3.3.3 clarifying 3.4 Ensuring consistent quality service for all types of customers 3.5 Avoid certain sensitive topics
4. Key principles and steps to retention	4.1. Retention Steps 4.1.1 Acknowledge the person 4.1.2 Clarify the situation 4.1.3 Meet or exceed the need 4.1.4 Confirm customer's satisfaction 4.2 Key Principles 4.2.1 Maintain or enhance self-esteem 4.2.2 Listen and respond with empathy 4.2.3 Involve the customer

EVIDENCE GUIDE

1 Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Received, assessed and responded to customer needs 1.2 Applied key principles and service steps of retention
2 Underpinning knowledge and attitude	2.1 Knowledge of how to determine customer needs and expectations related to the product or services 2.2 Knowledge of equipment to be used for specific tasks 2.3 Knowledge of privacy laws and industry standards for obtaining using and protecting information obtained from the customers or company 2.4 Knowledge on how to interact with customers
3 Underpinning skills	3.1 Basic oral and written communication skills 3.2 Basic customer service skills 3.3 Interpersonal skills 3.4 Listening Skills 3.5 Skill in demonstrating cost/benefits/value to customer based on customer expectations and needs 3.6 Skill in generating alternative solutions that will meet customers expectation
4 Resource Implications	4.1 Materials relevant to the proposed activity or tasks
5 Method of assessment	5.1 Observation and Oral questioning 5.2 Portfolio 5.6 Third Party Report
6 Context of assessment	6.3 Competency may be assessed in the workplace or in a simulated workplace setting 6.4 Assessment shall be undertaken either individually or part of team under limited supervision

SECTION 3 TRAINING STANDARDS

3.1 CURRICULUM DESIGN

Course Title: Broadband Installation (Fixed Wireless Systems) NC Level: NC II

Nominal Training Duration: 18 hrs – Basic Competencies
18 hrs – Common Competencies
80 hrs – Core Competencies

Course Description:

This course is designed to develop & enhance the knowledge, skills, & attitudes of a fixed wireless broadband installer, in accordance with industry standards. It covers the basic and common competencies in addition to the core competencies such as installing mast and accessories, laying out of cables, and installing and configuring the CPE.

BASIC COMPETENCIES

18 hrs

Unit of Competency	Learning Outcome	Methodology	Assessment Approach
1. Participate in Workplace Communication	1.1 Access specific and relevant information from appropriate sources 1.2 Use effective questioning, active listening and speaking skills to gather and convey information 1.3 Use appropriate form and lines of communication 1.4 Conduct meeting according to established purpose and protocols 1.5 Use appropriate forms in recording and transmitting information 1.6 Complete reports according to organizational guidelines and requirements	<ul style="list-style-type: none">• Group discussion• Interaction	<ul style="list-style-type: none">• Demonstration• Observation• Interviews/questioning

<p>2. Work in a Team Environment</p>	<p>2.1 Identify the role and objective of the team and individual members</p> <p>2.2 Specify reporting relationships within and outside the team</p> <p>2.3 Use appropriate forms of communication and interaction with team members</p> <p>2.4 Observe protocols in reporting</p> <p>2.5 Contribute to the development of the team work plans and activities</p>	<ul style="list-style-type: none"> • Discussion • Interaction 	<ul style="list-style-type: none"> • Demonstration • Observation • Interviews/questioning
<p>3. Practice Career Professionalism</p>	<p>3.1 Identify growth areas and prepare a work plan towards improving oneself</p> <p>3.2 Identify inter and intra personal relationships</p> <p>3.3 Prioritize goals according to personal, team and organizational goals and objectives</p> <p>3.4 Identify training and career opportunities</p>	<ul style="list-style-type: none"> • Discussion • Interaction 	<ul style="list-style-type: none"> • Demonstration • Observation • Interviews/questioning
<p>4. Practice Occupational Health and Safety Procedures</p>	<p>4.1 Explain safety regulations according to organizational procedures</p> <p>4.2 Identify possible work hazards and explain contingency measures in case of workplace accidents</p> <p>4.3 Determine effects of hazards and risks and explain how to control them</p>	<ul style="list-style-type: none"> • Discussion • Plant tour • Symposium 	<ul style="list-style-type: none"> • Observation • Interview

COMMON COMPETENCIES

18 hrs

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Apply Quality Standards	1.1 Check materials and replace faulty ones in accordance with workplace standards and requirements 1.2 Carry out work assignments in accordance with standard operating procedures 1.3 Check completed work against standards and specifications 1.4 Document and prepare a report on deviations from specific quality standards	<ul style="list-style-type: none"> ▪ Field trip ▪ Symposium ▪ Film showing ▪ Simulation ▪ On-the-job training 	<ul style="list-style-type: none"> ▪ Demonstration & questioning ▪ Observation & questioning ▪ Third party report
2 Perform Computer Operations	2.1 Identify and Select appropriate hardware and software according to the tasks assigned and their required outcomes 2.2 Access/Use the necessary Program/application containing the information required 2.3 Use keyboard in line with techniques and OH & S ergonomic requirements 2.4 Transfer files, data between compatible systems using computer software, hardware/ peripheral devices in accordance with standard operating procedures 2.5 Implement procedures for ensuring security of data, file maintenance, including regular back-ups and virus checks in accordance with standard operating procedures	<ul style="list-style-type: none"> ▪ Lecture ▪ Discussion ▪ Demonstration ▪ Computer Based training/e-learning 	<ul style="list-style-type: none"> ▪ Practical Demonstration ▪ Observation and Questioning

CORE COMPETENCIES

80 hrs

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Install Mast and Accessories	1.1 Read & interpret work instructions as per plan 1.2 Identify the tools, equipment, testing devices, & materials needed for installation 1.3 Identify the PPE & OHS policies & procedures required for the installation job 1.4 Install mast and accessories 1.5 Conduct final inspection of the installed mast and accessories 1.6 Prepare an installation & testing report	<ul style="list-style-type: none"> ▪ Lecture ▪ Discussion ▪ Demonstration ▪ Viewing multimedia ▪ Hands on practice 	<ul style="list-style-type: none"> ▪ Observation in workplace ▪ Demonstration ▪ Oral questioning ▪ Third Party Report
2. Install and Lay Out Cables	2.1. Prepare necessary tools, equipment, materials and personal protective equipment (PPE in line with job requirements. 2.2. Set-up cable lay out and installation equipment is set up in accordance with manufacturer's and job requirements 2.3. Assess support structure as safe for normal working conditions and sound for cable support 2.4. Secured cable permanently to support structure in accordance with standard installation procedures	<ul style="list-style-type: none"> ▪ Lecture ▪ Discussion ▪ Demonstration ▪ Viewing multimedia ▪ Hands on practice 	<ul style="list-style-type: none"> ▪ Observation in workplace ▪ Demonstration ▪ Oral questioning ▪ Third Party Report
3. Install and Configure CPE	3.1 Prepare cables and connectors in accordance with standard industry practices 3.2 Read and interpret installation plan as per job requirements 3.3 Install radio antenna in accordance with standard industry practices and following safety procedures. 3.4 Document installation according to SOP 3.5 Test and adjust CPE in accordance with the company's installer manual 3.6 Demonstrated professionalism and interpersonal skills in dealing with subscriber concerns	<ul style="list-style-type: none"> ▪ Lecture ▪ Discussion ▪ Demonstration ▪ Viewing multimedia ▪ Hands on practice 	<ul style="list-style-type: none"> ▪ Observation in workplace ▪ Demonstration ▪ Oral questioning ▪ Third Party Report
4. Render Service Excellence to Customers	4.1 Determine and satisfy customers' needs 4.2 Conduct effective & efficient customer interactions 4.3 Dealing with difficult & emotional customers	<ul style="list-style-type: none"> ▪ Lecture ▪ Discussion ▪ Demonstration ▪ Viewing multimedia 	<ul style="list-style-type: none"> ▪ Observation in workplace ▪ Demonstration ▪ Oral questioning ▪ Third Party Report

3.2 TRAINING DELIVERY

The delivery of training should adhere to the design of the curriculum. Delivery should be guided by the 10 basic principles of the competency-based Technical and Vocational Education and Training (TVET).

- The training is based on curriculum developed from the competency standards;
- Learning is modular in its structure;
- Training delivery is individualized and self-paced;
- Training is based on work that must be performed;
- Training materials are directly related to the competency standards and the curriculum modules;
- Assessment is based in the collection of evidence of the performance of work to the industry required standard;
- Training is based both on and off-the-job components;
- Allows for recognition of prior learning (RPL) or current competencies;
- Training allows for multiple entry and exit; and
- Approved training programs are nationally accredited.

The competency-based TVET system recognizes various types of delivery modes, both on and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities may be adopted when designing training programs:

- The dualized mode of training delivery is preferred and recommended. Thus programs would contain both in-school and in-industry training or fieldwork components. Details can be referred to the Dual Training System (DTS) Implementing Rules and Regulations.
- Modular/self-paced learning is a competency-based training modality wherein the trainee is allowed to progress at his own pace. The trainer only facilitates the training delivery.
- Peer teaching/mentoring is a training modality wherein fast learners are given the opportunity to assist the slow learners.
- Supervised industry training or on-the-job training is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire a specific competencies prescribed in the training regulations.
- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructors are not in the same place. Distance learning may employ correspondence study, or audio, video or computer technologies.

3.3 TRAINEE ENTRY REQUIREMENTS

The trainees who wish to enter the course should possess the following requirements:

- At least high school graduate with computer background
- Can communicate in oral and written language
- Can perform basic mathematical computations
- Must be physically and mentally fit to undergo training

This list does not include specific institutional requirements such as educational attainment, appropriate work experience and others that may be required from the trainees by the school or training center delivering the TVET program.

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS (Institution-based)

Recommended list of tools, equipment and materials required for a class size of 20 trainees for Broadband Installation (Fixed Wireless Systems) NC II:

TOOLS		EQUIPMENT		MATERIAL	
Qty.	Description	Qty.	Description	Qty.	Description
5 sets	Adjustable wrench	5 sets	Computer w/ NIC Card	10 pcs	Roofmount bracket
5 sets	Blade cutter	5 sets	Radio antenna/modem	30 pcs	Tex Screw , 3/16"
5 sets	Combination Pliers	5 sets	Internet Subscription	15 pcs	Guy anchor
5 sets	Compass	20 sets	Tables and chairs	10 pcs	Hose clamp, No. 16
5 sets	Diagonal pliers	1 set	Projector	1 pc.	Whiteboard
5 sets	RJ-45 crimper	1 pc.	Whiteboard	20 pcs.	RJ 45 connectors
5 sets	Extension cord	20 sets	Company manual		
5 sets	Flash light	5 sets	Safety harness		
5 sets	Standard Screwdriver	5 sets	Safety gloves		
5 sets	Hammer	5 sets	Safety goggles		
1 pc	Extension Ladder				
5 sets	Level				
5 sets	Long nose pliers				
5 sets	Combination wrenches				
5 sets	Toolbox				
5 sets	Vise grip				

3.5 TRAINING FACILITIES

Recommended space requirements for the various teaching/learning areas are as follows:

TEACHING/LEARNING AREAS	SIZE IN METERS (M)	AREA IN SQ. M	QTY	TOTAL AREA IN SQ. M
Lecture Area	6 x 8	48	1	48
Laboratory Area (field-based)	7 X 8	56	1	56
Learning Resource Area	4 x 5	20	1	20
Wash ,Toilet & Locker Room	2 x 5	10	2	20
Total				144
Facilities / Equipment / Circulation*				35
Total Area				179

3.6 TRAINERS QUALIFICATIONS

Broadband Installation (Fixed Wireless System) NC II Trainer's Qualification TQ II

- Must be a holder of Broadband Installation (Fixed Wireless System) NCII or equivalent
- Must have completed Training Methodology II (TM II) course or equivalent
- * Must have at least 5-years relevant industry experience.
- Must be physically & mentally fit.

* Optional: Only when required by the hiring institution.

3.7 INSTITUTIONAL ASSESSMENT

Institutional assessment is undertaken by trainees to determine their achievement of units of competency. A certificate of achievement is issued for each unit of competency.

SECTION 4: NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

- 4.1 To attain the National Qualification of **Broadband Installation (Fixed Wireless Systems) NC II**, the candidate must demonstrate competency in all the units listed in Section 1. Successful candidates shall be awarded a **National Certificate II** signed by the TESDA Director General.
- 4.2 The qualification of Fixed Wireless Broadband Installation NC II may be attained through demonstration of competence through project-type assessment covering all the units required in the qualification.
- 4.3 Assessment shall focus on the core units of competency. The basic and common units shall be integrated or assessed concurrently with the core units.
- 4.4 The following are qualified to apply for assessment and certification:
 - 4.4.1 Graduate of formal, non-formal, and informal including enterprise-based training programs.
 - 4.4.2 Experienced workers (wage employed or self employed)
- 4.5 The guidelines on assessment and certification are discussed in detail in the “Procedures Manual on Assessment and Certification” and “Guidelines on the Implementation of the Philippine TVET Qualification and Certification System (PTQCS)”.

DEFINITION OF TERMS

GENERAL

- 1) **Certification** - is the process of verifying and validating the competencies of a person through assessment
- 2) **Certificate of Competency (COC)** – is a certification issued to individuals who pass the assessment for a single unit or cluster of units of competency
- 3) **Common Competencies** - are the skills and knowledge needed by all people working in a particular industry
- 4) **Competency** - is the possession and application of knowledge, skills and attitudes to perform work activities to the standard expected in the workplace
- 5) **Competency Assessment** - is the process of collecting evidence and making judgments on whether competency has been achieved
- 6) **Competency Standard (CS)** - is the industry-determined specification of competencies required for effective work performance
- 7) **Context of Assessment** - refers to the place where assessment is to be conducted or carried out
- 8) **Core Competencies** - are the specific skills and knowledge needed in a particular area of work - industry sector/occupation/job role
- 9) **Critical aspects of competency** - refers to the evidence that is essential for successful performance of the unit of competency
- 10) **Elective Competencies** - are the additional skills and knowledge required by the individual or enterprise for work
- 11) **Elements** - are the building blocks of a unit of competency. They describe in outcome terms the functions that a person performs in the workplace.
- 12) **Evidence Guide** - is a component of the unit of competency that defines or identifies the evidences required to determine the competence of the individual. It provides information on critical aspects of competency, underpinning knowledge, underpinning skills, resource implications, assessment method and context of assessment
- 13) **Level** - refers to the category of skills and knowledge required to do a job
- 14) **Method of Assessment** - refers to the ways of collecting evidence and when, evidence should be collected

- 15) **National Certificate (NC)** – is a certification issued to individuals who achieve all the required units of competency for a national qualification defined under the Training Regulations. NCs are aligned to specific levels within the PTQF
- 16) **Performance Criteria** - are evaluative statements that specify what is to be assessed and the required level of performance
- 17) **Qualification** - is a cluster of units of competencies that meets job roles and is significant in the workplace. It is also a certification awarded to a person on successful completion of a course in recognition of having demonstrated competencies in an industry sector
- 18) **Range of Variables** - describes the circumstances or context in which the work is to be performed
- 19) **Recognition of Prior Learning (RPL)** – is the acknowledgement of an individual's skills, knowledge and attitudes gained from life and work experiences outside registered training programs
- 20) **Resource Implications** - refers to the resources needed for the successful performance of the work activity described in the unit of competency. It includes work environment and conditions, materials, tools and equipment
- 21) **Basic Competencies** - are the skills and knowledge that everyone needs for work
- 22) **Training Regulations (TR)** – refers to the document promulgated and issued by TESDA consisting of competency standards, national qualifications and training guidelines for specific sectors/occupations. The TR serves as basis for establishment of qualification and certification under the PTQF. It also serves as guide for development of competency-based curricula and instructional materials including registration of TVET programs offered by TVET providers
- 23) **Underpinning Knowledge** - refers to the competency that involves in applying knowledge to perform work activities. It includes specific knowledge that is essential to the performance of the competency
- 24) **Underpinning Skills** - refers to the list of the skills needed to achieve the elements and performance criteria in the unit of competency. It includes generic and industry specific skills
- 25) **Unit of Competency** – is a component of the competency standards stating a specific key function or role in a particular job or occupation; it is the smallest component of achievement that can be assessed and certified under the PTQF

SPECIFIC

- 1) **Antenna** - a conductor by which electromagnetic waves are sent out or received.
- 2) **Bandwidth** - the amount of data transmitted in a given amount of time; usually measured in bits per second, kilobits per second, and megabits per second.
- 3) **Base Transceiver Station (BTS)** - contains the equipment for transmitting and receiving of radio signals (transceivers), antennas, and equipment for encrypting and decrypting communications with the Base Station Controller.
- 4) **Bit** - a single unit of data, either a one or a zero. In the world of broadband, bits are used to refer to the amount of transmitted data. A kilobit (Kb) is approx. 1,000 bits. A megabit (Mb) is approximately 1,000,000 bits.
- 5) **Broadband** - a descriptive term for evolving digital technologies that provide consumers with integrated access to voice, high-speed data service, video-demand services, and interactive delivery services (e.g. Fixed Wireless, DSL, Cable Internet).
- 6) **Computer network** - is an interconnection of a group of computers.
- 7) **CPE (Customer Premise Equipment)** - is any terminal and associated equipment and inside wiring located at a subscriber's premises
- 8) **Ethernet** - is a family of frame-based computer networking technologies for local area networks (LANs).
- 9) **Fixed Wireless** - refers to wireless devices or systems that are situated in fixed locations, such as an office or home, as opposed to devices that are mobile, such as cell phones and Personal Digital Assistant (PDAs). Fixed wireless devices normally derive their electrical power from utility mains, as opposed to portable wireless devices that normally derive their power from batteries.
- 10) **Fixed Wireless Broadband Access** - is a digital microwave radio technology, which allows radio waves to propagate from a Base Station in Line of Sight (LOS) or Non-Line of Sight (NLOS) to be received by a Customers Premises Equipment (CPE), which is located at the premises to be served e.g school, hospital, clinic, fire or police station, mosque, residential home etc., and from there distributed over a high bandwidth cable.
- 11) **FTP (foil screened twisted pair)** - is a cable containing multiple pairs of copper wire enclosed in a sheath of aluminum foil. It's used in wiring systems in buildings or other environments where heavy noise adjacent to the wire might cause interference.
- 12) **Internet** - is a collection of interconnected computer networks, linked by copper wires, fiber-optic cables, wireless connections, etc.

- 13) **Line-of-Sight (LoS) propagation** - refers to electro-magnetic radiation traveling in a straight line. The rays or waves are deviated or reflected by obstructions and cannot travel over the horizon or behind obstacles. Beyond that, material disperses the rays respectively the energy of the waves.
- 14) **Mast** - a long upright pole.
- 15) **NIC (Network Interface Card)** - is a piece of computer hardware designed to allow computers to communicate over a computer network.
- 16) **Propagation** - the motion of waves through or along a medium
- 17) **Signal** - is any time-varying or spatial-varying quantity that can carry information.
- 18) **Surge Suppressor** - is an appliance designed to protect electrical devices from voltage spikes. A surge suppressor/protector attempts to regulate the voltage supplied to an electric device by either blocking or by shorting to ground voltages above a safe threshold.
- 19) **Transmission medium** - any material substance, such as fiber-optic cable, twisted pair, coaxial cable, dielectric-slab waveguide, water, and air (free-space), that can be used for the propagation of signals, usually in the form of modulated radio, light, or acoustic waves, from one point to another.
- 20) **Transceiver** - is a device that has both a transmitter and a receiver which are combined and share common circuitry or a single housing.
- 21) **Telecommunication** - is the assisted transmission of signals over a distance for the purpose of communication.
- 22) **UTP (unshielded twisted pair)** - cable which is not surrounded by any shielding and often called as Ethernet cable.
- 23) **World Wide Web** - (commonly shortened to **the Web**) is a system of inter-linked hypertext documents accessed via the Internet. With a Web browser, a user views Web pages that may contain text, images, videos, and other multimedia and navigates between them using hyperlinks.

ANNEX A - ICT SECTOR COMPETENCY MAP –BROADBAND INSTALLATION (FIXED WIRELESS SYSTEMS) NC II



BASIC COMPETENCIES

Receive and Respond to workplace communication	Work with Others	Demonstrate Work Values	Participate in Workplace Communication	Work in a Team Environment	Practice Career Professionalism	Practice occupational Health and Safety Procedures
Practice Housekeeping Procedures (5S)	Lead Workplace Communication	Lead Small Team	Develop and Practice Negotiation Skills	Solve Problems Related to Work Activities	Use Mathematical Concepts and Techniques	Use Relevant Technologies
Utilize Specialized Communication skills	Develop Team and Individual	Apply Problem Solving Techniques in the Workplace	Collect, Analyze and Organize Information	Plan and Organize Work	Promote Environmental Protection	

COMMON COMPETENCIES

Apply Quality Standards	Perform Computer Operations
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CORE COMPETENCIES

Communicate Effectively using the English Language	Deliver Quality Customer Service	Communicate Effectively in a Customer Contact Center	Use Business Technology	Use Medical Terminology to Carry Out Task	Produce Text from Audio Transcription	Review / Edit Documents
Demonstrate Understanding and Knowledge of the American Culture and Geography	Perform Basic Computer Operation and Internet Navigation	Lead a Contact Center Work Team	Produce Cleaned-up and In-betweened Drawings	Produce Background Designs	Produce Over-all Designs for Animation	Produce Storyboard for Animation
Manage the Activities of a Work Team	Lead a Team in Delivering Quality Service	Composit and Edit Animation Sequence	Create 3D Models and Images	Create 2D Models and Images	Produce 2D Colored Animation	Produce Key Drawings for Animation
Use email and search the web using browsers	Install Computer Systems and Networks	Maintain Computer Systems and Networks	Operate a word-processing application	Operate a spreadsheet application	Operate a presentation package	Install and maintain a server
Configure Computer Systems and Networks	Diagnose and Troubleshoot Computer Systems and Networks	Apply program development approach	Apply object-oriented program language skills	Apply programming skills in a second language	Install network hardware to a network	Install software to networked computers
Render Service Excellence to Customers	Install Mast and Accessories	Install and Lay Out Cables	Install and Configure CPE	Build a database	Design program logic	Install and configure a network
Determine and confirm client business expectations and needs	Create a simple mark-up language document to specification	Design a website to meet technical requirements	Transfer content to a website using commercial packages	Determine and apply appropriate development methodologies	Ensure website content meets technical protocols and standards	Design pages using a page layout application
Use structured query language to create database structures & manipulate data	Develop detailed technical design	Act on and complete change requests	Determine and act on client computing problems	Provide one -to - one instruction	Provide first-level remote help desk support	Develop design studies
Create vector graphics using a graphics application	Create raster graphics using a graphics application	Develop designs for print media	Develop designs for electronic media	Develop designs for product packaging	Design booth & product/window display	

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