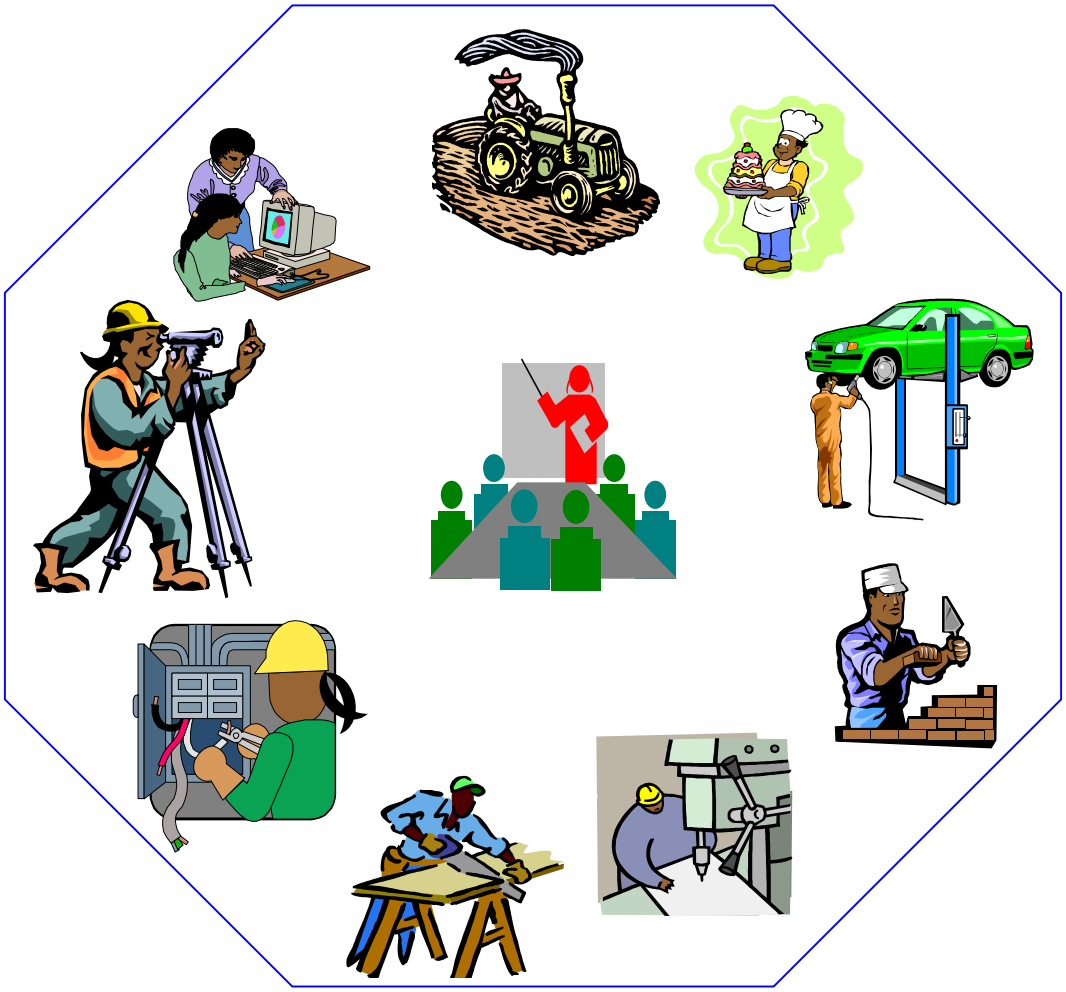
Federal Democratic Republic of Ethiopia

OCCUPATIONAL STANDARD

BASIC ELECTRICAL/ELECTRONIC EQUIPMENT SERVICING

NTQF Level I



Ministry of Education

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Introduction

Ethiopia has embarked on a process of reforming its TVET-System. Within the policies and strategies of the Ethiopian Government, technology transformation – by using international standards and international best practices as the basis, and, adopting, adapting and verifying them in the Ethiopian context – is a pivotal element. TVET is given an important role with regard to technology transfer. The new paradigm in the outcome-based TVET system is the orientation at the current and anticipated future demand of the economy and the labor market.

The Ethiopia Occupational Standards (EOS) is the core element of the Ethiopian National TVET-Strategy and an important factor within the context of the National TVET Qualification Framework (NTQF).They are national Ethiopia standards, which define the occupational requirements and expected outcome related to a specific occupation without taking TVET delivery into account.

This document details the mandatory format, sequencing, wording and layout for the Ethiopia Occupational Standard which comprised of Units of Competence.

A Unit of Competence describes a distinct work activity. It is documented in a standard format that comprises:

- Occupational title, NTQF level
- Unit code
- Unit title
- Unit descriptor
- Elements and Performance criteria
- Variables and Range statement
- Evidence guide

Together all the parts of a Unit of Competence guide the assessor in determining whether the candidate is competent.

The ensuing sections of this EOS document comprise a description of the occupation with all the key components of a Unit of Competence:

- chart with an overview of all Units of Competence for the respective level including the Unit Codes and the Unit Titles
- contents of each Unit of Competence (competence standard)
- occupational map providing the technical and vocational education and training (TVET) providers with information and important requirements to consider when designing training programs for this standards and for the individual, a career path

UNIT OF COMPETENCE CHART

Occupational Standard: Basic Electrical/Electronic Equipment Servicing

Occupational Code: EEL BEE

NTQF Level I

EEL BEE1 01 0511 Use Hand Tools and Test Instruments	EEL BEE1 02 0511 Perform Measurement and Calculation	EEL BEE1 03 0511 Prepare and Interpret Technical Drawing
EEL BEE1 04 0511 Test Electrical & Electronic Parts	EEL BEE1 05 0511 Design and Construct Simple Printed Circuit Board	EEL BEE1 06 0511 Terminate and Connect Electrical Wirings and Electronics Circuit
EEL BEE1 07 0511 Troubleshoot AC/DC Power Supply with Single-Phase Input	EEL BEE1 08 0511 Perform Basic Computer Operation	EEL BEE1 09 0511 Perform Housekeeping Procedures
EEL BEE1 10 0511 Receive and Respond to Workplace Communication	EEL BEE1 11 0511 Work with Others	EEL BEE1 12 0511 Demonstrate Work Values
EEL BEE1 13 0511 Apply Quality Standards	EEL BEE1 14 0511 Develop understanding of entrepreneurship	EEL BEE1 15 1012 Apply 5S Procedures

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Use Hand Tools and Test Instruments**
Unit Code	**EEL BEE1 01 0511**
Unit Descriptor	This unit covers the knowledge, skills and attitudes on the safe use, handling and maintenance of tools and test instruments.

Elements	Performance Criteria
1. Plan and prepare tasks and workstation	1.1 Tasks to be undertaken are properly identified 1.2 Appropriate ***hand tools and test instruments*** are identified and selected according to the task requirements 1.3 Workstation is made ready in accordance with job requirements/specifications
2. Prepare hand tools	2.1 Appropriate hand tools are checked for proper operation and safety 2.2 Unsafe or faulty tools are identified and marked for repair according to standard company procedure
3. Use hand tools and test equipment	3.1 Tools are used according to tasks undertaken 3.2 All safety procedures in using tools are observed at all times and appropriate ***personal protective equipment*** (PPE) are used 3.3 Malfunctions, unplanned or unusual events are reported to the supervisor
4. Maintain hand tools	4.1 Tools are handled without damage according to procedures 4.2 Routine ***maintenance*** of tools is undertaken according to standard operational procedures, principles and techniques 4.3 Tools are stored safely in appropriate locations in accordance with manufacturer's specifications or standard operating procedures

Variable	Range
Hand tools and test instruments	• Hand tools for adjusting, dismantling, assembling, finishing and cutting. Tool set includes the following but not limited to: screw drivers, pliers, punches, wrenches, files • Test instruments for measuring voltage, current, and resistance. Test instruments include: volt meter, ohmmeter, ammeter, frequency meter, power meter, Kwh meter,

Personal Protective Equipment (PPE)	PPE includes the following but not limited to: • Gloves • Protective eyewear • Apron/overall
Maintenance	• Cleaning • Lubricating • Tightening • Simple tool repairs • Hand sharpening • Adjustment using correct procedures

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • demonstrated safe working practices at all times • communicated information about processes, events or tasks being undertaken to ensure a safe and efficient working environment • planned tasks in all situations and reviewed task requirements • performed all tasks to specification • maintained and stored tools in appropriate location
Underpinning knowledge	• Safety requirements in handling tools • Tools: Function, Operation, Common faults • Maintenance of tools • Storage of Tools
Underpinning skills	• Reading skills required to interpret work instruction and numerical skills • Communication skills • Problem solving in emergency situation
Resource Implication	Tools may include the following but not limited to: • Screw drivers, Pliers, Punches • Wrenches, files
Method of assessment	Competence in this unit must be assessed through: • Observation • Oral questioning
Context of Assessment	Assessment may be conducted in the workplace or in a simulated work environment

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Perform Measurement and Calculation**
Unit Code	**EEL BEE1 02 0511**
Unit Descriptor	This unit covers the knowledge, skills and attitudes needed to identify, care, handle and use measuring instruments.

Elements	Performance Criteria
1. Plan and prepare tasks	1.1 Object or component to be measured is identified according to procedures 1.2 Correct specifications are obtained from relevant source 1.3 Measuring tools are selected in line with job requirements 1.4 Workstation is made ready in accordance with job specifications
2. Select measuring instruments	2.1 Appropriate ***measuring instrument*** is selected to achieve required outcome 2.2 Accurate measurements are obtained for job 2.3 ***Calculation*** needed to complete work tasks are performed using the four basic process of addition (+), subtraction (-), multiplication (x), and division (/) 2.4 Calculation involving fractions, percentages and mixed numbers are used to complete workplace tasks. 2.5 Numerical computation is checked and corrected for accuracy 2.6 Instruments are read to the limit of accuracy of the tool.
3. Carry out measurements and calculation	3.1 Measuring instruments are handles without damage according to procedures 3.2 Measuring instruments are cleaned before and after using. 3.3 Proper storage of instruments is undertaken according to manufacturer's specifications and standard operating procedures.
4. Maintain measuring instruments	4.1 Object or component to be measured is identified according to procedures 4.2 Correct specifications are obtained from relevant source 4.3 Measuring tools are selected in line with job requirements

Variable	Range

Measuring instruments	• Straight edge • Torque gauge • Try square • Protractor • Combination gauge • Steel rule
Calculation	Includes the following but not limited to – • Volume • Area • Displacement • Inside diameter • Circumference • Length • Thickness • Outside diameter • Taper • Out of roundness

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Selected proper measuring instruments according to tasks • Carried out measurement and calculations • Maintained and stores instruments
Underpinning knowledge	• Types of measuring instruments and their uses • Safe handling procedures in using measuring instruments • Four fundamental operation of mathematics • Formula for volume, area, perimeter and other geometric figures
Underpinning skills	• Reading skills required to interpret work instruction • Communication skills

	• Handling measuring instruments • Performing mathematical calculations using the four fundamental operations • Visualizing objects and shapes • Interpreting formulae
Resource implication	• Place of assessment • Measuring instruments • Straight edge • Torque gauge • Try square • Protractor • Combination gauge • Steel rule
Method of assessment	Competence in this unit must be assessed through: • Observation / Demonstration • Oral questioning / Written Test
Context of Assessment	Assessment may be conducted in the workplace or in a simulated work environment

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Prepare and Interpret Technical Drawing**
Unit Code	**EEL BEE1 03 0511**
Unit Descriptor	This unit covers the knowledge, skills and attitudes and values needed to prepare/interpret diagrams, engineering abbreviation and drawings, symbols, dimension.

Elements	Performance Criteria
1. Identify different kinds of technical drawings	1.1 Correct ***technical drawing*** is selected according to job requirements 1.2 Technical drawings are segregated in accordance with the types and kinds of drawings
2. Interpret technical drawing	2.1 Components, assemblies or objects are recognized as required 2.2 ***Dimensions*** of the key features of the objects depicted in the drawing are correctly identified 2.3 ***Symbols*** used in the drawing are identified and interpreted correctly 2.4 Drawing is checked and validated against job requirements or equipment in accordance with standard operating procedures
3. Prepare/make changes to schematics and drawings	3.1 Electrical/electronic schematic is drawn and correctly identified 3.2 Correct drawing is identified, equipment are selected and used in accordance with job requirements
4. Store technical drawings and equipment /instruments	4.1 Care and maintenance of drawings are undertaken according to company procedures 4.2 Technical drawings are recorded and inventory is prepared in accordance with company procedures 4.3 Proper storage of instruments is undertaken according to company procedures

Variable	Range
Technical drawings	Technical drawings include the following but not limited to: • Schematic diagrams • Charts • Block diagrams

	• Lay-out plans • Location plans • Process and instrumentation diagrams • Loop diagrams • System Control Diagrams
Dimensions	Dimensions may include but not limited to: • Length • Width • Height • Diameter • Angles
Symbols	May include but not limited to: • NEC- National Electric Code • IEC -International Electro-technical Commission • ASME - American Society of Mechanical Engineers
Instruments/ Equipment	• Components/dividers • Drawing boards • Rulers • T-square • Calculator

Evidence Guide	
Critical Aspects of competencies	Assessment require evidence that the candidate: • Selected correct technical drawing in line with job requirements • Correctly identified the objects represented in the drawing • Identified and interpreted symbols used in the drawing correctly • Prepared/produced electrical/electronic drawings including all relevant specifications • Stored diagrams/equipment
Underpinning knowledge	• Drawing conventions • Symbols • Dimensioning Conventions • Mark up/Notation of Drawings • Mathematics ▪ Four fundamental operations

	▪ Percentage ▪ Fraction ▪ Trigonometric Functions ▪ Algebra ▪ Geometry
Underpinning skills	• Drawing and Reading skills required to interpret work instruction • Communication skills • Interpreting electrical/electronic signs and symbols
Resource implication	• Drawings • Diagrams • Charts • Plans
Method of assessment	Competence in this unit must be assessed through: • Demonstration or practical tasks involving interpretation of a range of technical drawings • Oral questioning / Written test
Context of Assessment	Assessment may be conducted in the workplace or in a simulated environment

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Test Electrical & Electronic Parts**
Unit Code	**EEL BEE1 04 0511**
Unit Descriptor	This unit covers the knowledge, skills and attitudes needed to identify and testing of electrical & electronics parts.

Elements	Performance Criteria
1. Plan and prepare to identify/test electrical/electronic parts	1.1 ***Materials*** are checked according to specifications and tasks 1.2 Appropriate ***tools and test instrument*** are selected according to task requirements 1.3 Task is planned to ensure occupational health and safety (OHS) guidelines and procedures are followed 1.4 Electrical/electronic parts are identified correctly and prepared for testing, de-soldering/soldering of electronic parts in accordance with instructions and work procedures
2. Identify and test Electrical/electronic parts	2.1 Safety procedures in using hand tools/test instrument are observed at all times and appropriate ***personal protective equipment*** are used 2.2 Work is undertaken safely in accordance with the workplace and standard procedures 2.3 Important **Electrical/Electronic Components/parts** are identified 2.4 Appropriate range of ***methods*** in testing **electrical /electronic circuits & parts** (*capacitor, diode, resistor, transistor, power supply and other electrical/electronic component*) are used according to specifications, manufacturer's requirements and safety 2.5 Correct use of test/measuring instrument is followed according to electrical/electronic parts function and specification 2.6 Confirm the electrical/electronic parts data, function and value in accordance to parts/component specification

3. Test the construction of electrical/ electronic circuits	3.1 ***Testing*** of the completed construction of electrical/electronic circuits is conducted for compliance with specifications and regulations using appropriate procedures and equipment 3.2 ***Check the accurate operation*** of the constructed circuit 3.3 Unplanned events or conditions are responded to in accordance with established procedures

Variable	**Range**
Materials	Materials included the following but not limited to: • Soldering lead • Flux • Cables • Printed circuit board (PCB) • Electrical/Electronic parts and components (resistor, diode, transistor, capacitor etc.) • Wires • AC/DC power supply • Data book
Tools, test/measuring instrument	Tool set includes the following but not limited to: • Pliers • Cutters • Screw drivers • Steel rule Equipment • Soldering gun • Multi-tester • Megger tester
Personal protective equipment	May include but not limited to: • Goggles • Gloves • Apron/overall
Electrical/Electronic Components	• Passive components • Active components • Logic gates • IC's

Electrical /electronic circuits	• Power supply • Rectifier • Amplifier
Methods	• Amp/milliamp reading • Voltage/millivolt reading • Soldering/de-soldering techniques • Resistance test • Continuity test • Short/open circuit test • Input/output test • Colour code/Value reading • Components pin identification

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Undertook work safely and according to workplace and standard procedures • Used appropriate electrical/electronic test/measuring instrument • Used appropriate electrical/electronic test/measuring techniques • followed correct procedures in testing/measuring electronic parts and component • performed identification of parts and value reading • Conducted testing of the constructed electrical/electronic circuits using appropriate procedures and standards
Underpinning Knowledge and Attitudes	• specifications and use of tools • use of test instruments/equipment • electrical/electronics theory • single phase ac principles • wiring techniques • AC/DC power supplies • soldering/de-soldering method and techniques • colour code and specification of parts
Underpinning Skills	• Reading skills required to interpret work instruction • Communication skills • Soldering/de-soldering techniques • Circuit construction skill

	• Use of test/measuring instrument techniques • Data book Reading skill
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, computer and information on workplace practices and OHS practices
Assessment Methods	Competence may be assessed through: • Interview / Oral questioning / Written Test • Observation/Demonstration/Practical work
Context of Assessment	Competence may be assessed in a well organized work place or in a simulated work environment

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Design and Construct Simple Printed Circuit Board**
Unit Code	**EEL BEE1 05 0511**
Unit Descriptor	This unit covers the knowledge, skills and attitudes needed to design and construct basic consumer electrical/electronics circuits.

Elements	Performance Criteria
1. Plan and prepare to construct/ electrical/electronics circuits	1.1 ***Materials*** are checked according to specifications and tasks 1.2 Appropriate ***tools and equipments*** are selected according to task requirements 1.3 Task is planned to ensure occupational health and safety (OHS) guidelines and procedures are followed 1.4 Electrical/electronic circuits are correctly prepared for connecting and soldering in accordance with instructions and work site procedures
2. Construct electrical /electronics circuits on PCB	2.1 Safety procedures in using hand tools/equipments are observed at all times and appropriate ***personal protective equipment*** are used 2.2 Work is undertaken safely in accordance with the workplace and standard procedures 2.3 Important **Electrical/Electronics Components** are identified 2.4 Appropriate range of ***methods*** in constructing **electrical /electronics circuits**(*Amplifiers, oscillators, power supply, digital circuits, air conditioner control circuit*) are used according to specifications, manufacturer's requirements and safety 2.5 Correct sequence of operation is followed according to job specifications(*for example Transformer → Rectifier→ Filter → Regulator → Output to construct linear power supply circuit*) 2.6 ***Accessories*** used are adjusted, if necessary 2.7 Confirm the construction undertaken successfully in accordance with job specification

3. Test the construction of electrical/ electronic circuits	3.1 ***Testing*** of the completed construction of electrical/electronic circuits is conducted for compliance with specifications and regulations using appropriate procedures and equipment 3.2 ***Check the accurate operation*** of the constructed circuit 3.3 Unplanned events or conditions are responded to in accordance with established procedures

Variable	**Range**
Materials	Materials included the following but not limited to: • Soldering lead • Flux • Cables • Ferric-chloride, permanent(ink) marker, sticker(reflector) • Printed circuit board (PCB) • Electrical/Electronic components and elements • Wires
Tools and equipment	Tool set includes the following but not limited to: • Pliers • Cutters • Screw drivers • Steel rule Equipment • Soldering gun • Hand drill • Multi-tester
Personal protective equipment	May include but not limited to: • Goggles • Gloves • Apron/overall
Electrical/Electronic Components	• Passive components • Active components • Logic gates • IC's
Electrical /electronic circuits	• Amplifiers (Voltage amplifiers, Current amplifier, Power amplifier) • Oscillators • Power supply, Rectifier • Digital circuits (Adder, Subtractor, Encoder/Decoder, Multiplexer/De-multiplexer, Flip-flops, Counter, Shift register)

	• Air conditioner control circuit
Methods	• Terminating • Pin connection • Soldering joints • Plugs

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Undertook work safely and according to workplace and standard procedures • Used appropriate PCB construction methods • followed correct sequence in constructing the electrical/electronics circuit process on PCB • Conducted testing of the constructed electrical/electronic circuits using appropriate procedures and standards
Underpinning Knowledge and Attitudes	• specifications and use of tools • use of test instruments/equipment • electrical/electronics theory • PCB construction process • single phase ac principles • wiring techniques • DC power supplies • soldering/de-soldering method and techniques
Underpinning Skills	• Reading skills required to interpret work instruction • Communication skills • Soldering/de-soldering techniques • Circuit construction skill on PCB
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, computer and information on workplace practices and OHS practices
Assessment Methods	Competence may be assessed through: • Interview / Oral questioning / Written Test • Observation/Demonstration/Practical work
Context of Assessment	Competence may be assessed in a well organized work place or in a simulated work environment

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Terminate and Connect Electrical Wirings and Electronic Circuits**
Unit Code	**EEL BEE1 06 0511**
Unit Descriptor	This unit covers the knowledge, skills and attitudes needed to terminate and connect electrical wirings and electronic circuits.

Elements	Performance Criteria
1. Plan and prepare for termination/ connection of electrical wiring/electronics circuits	1.1 ***Materials*** are checked according to specifications and tasks 1.2 Appropriate ***tools and equipment*** are selected according to tasks requirements 1.3 Task is planned to ensure OH & S guidelines and procedures are followed 1.4 Electrical wiring/electronic circuits are correctly prepared for connecting/termination in accordance with instructions and work site procedures
2. Terminate/ connect electrical wiring/electronic circuits	2.1 Safety procedures in using tools are observed at all times and appropriate ***personal protective equipment*** are used 2.2 Work is undertaken safely in accordance with the workplace and standard procedures 2.3 Appropriate range of ***methods*** in termination/connection are used according to specifications, manufacturer's requirements and safety 2.4 Correct sequence of operation is followed according to job specifications 2.5 ***Accessories*** used are adjusted, if necessary 2.6 Confirm termination/connection undertaken successfully in accordance with job specification
3. Test termination/ connections of electrical wiring/ electronics circuits	3.1 Testing of all completed termination/ connections of electric wiring/electronic circuits is conducted for compliance with specifications and regulations using appropriate procedures and equipment 3.2 Wiring and circuits are checked using specified testing procedures 3.3 Unplanned events or conditions are responded to in accordance with established procedures

Variable	Range
Materials	Materials included the following but not limited to: • Soldering lead • Cables • Wires • Insulating materials • flux
Tools and equipment	Tool set includes the following but not limited to: • Pliers • Cutters • Screw drivers • Insulation remover Equipment • Soldering gun • Multi-tester
Personal protective equipment	May include but not limited to: • Goggles • Gloves • Apron/overall
Methods	• Clamping • Pin connection • Soldered joints • Plugs
Accessories	Accessories may include the following but not limited to: • Brackets • Clamps

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Undertook work safely and according to workplace and standard procedures • Used appropriate termination/ connection methods • followed correct sequence in termination / connection process • Conducted testing of terminated connected electrical wiring/electronic circuits using appropriate procedures and standards

Underpinning Knowledge and Attitudes	• specification and use of tools • use of test instruments/equipment • electrical theory • single phase ac principles • wiring techniques • Type of wires • DC power supplies • soldering method and techniques
Underpinning Skills	• Reading skills required to interpret work instruction • Communication skills • Soldering techniques
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Assessment Methods	Competence may be assessed through: • Interview / Oral questioning / Written Test • Observation/Demonstration
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Troubleshoot AC/DC Power Supply with Single-phase Input**
Unit Code	**EEL EES1 07 0511**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to troubleshoot and repair single-phase AC/DC power supply that includes transformer rewinding

Elements	Performance Criteria
1. Prepare product and work station for troubleshooting	1.1 Troubleshooting workplace is prepared in accordance with ***OH&S policies and procedures*** 1.2 ***Responsible person*** is consulted for effective and proper work coordination 1.3 Required ***materials*, *tools and equipment*** are prepared and checked in accordance with established procedures 1.4 Parts and materials needed to complete the work are prepared and obtained according to requirements
2. Diagnose faulty parts of power supply	2.1 Troubleshooting procedures are followed in accordance with OH&S policies and procedures 2.2 Test instruments required for the job are used to test the required parameters in accordance with the manufacturer's data and safety procedures 2.3 ***defects/fault parts*** are identified using specified testing procedures 2.4 Identified defects and faults are explained to the responsible person in accordance with company policy and procedures 2.5 Results of diagnosis and testing are documented accurately and completely within the specified time 2.6 Customers are advised / informed regarding the status and serviceability of the unit
3 Maintain/repair the power supply unit	3.1 Personal protective equipments are used in accordance with ***Occupational Health and Safety*** practices 3.2 Defective parts/components are replaced with identical or recommended appropriate equivalent ratings 3.3 **Repaired or replaced parts/components** are soldered/mounted in accordance with the current industry standards 3.4 Control settings/adjustments are performed in conformity with

	service-manual specifications 3.5 Repair activity is performed within the required timeframe 3.6 Cleaning of unit is performed in accordance with standard procedures
4 Rewind low-power transformer	4.1 Rewinding process is performed in accordance with OH&S policies and procedures 4.2 Process is checked according to established standards and requirements 4.3 Test instruments required for the job are used to test the required parameters in accordance with the manufacturer's data and safety procedures
5 Assemble low-power transformer	5.1 ***Assembling processes*** are performed in accordance with OH&S policies and procedures 5.2 Process is checked according to established standards and requirements 5.3 Assembled products are checked in accordance with quality standards
6 Test and inspect repaired products	6.1 Repaired products are subjected to final visual inspection and testing in accordance with quality standards, procedures and requirements 6.2 Work completion is documented and responsible person is informed in accordance with established procedures 6.3 Housekeeping procedures are observed in accordance with 5S discipline and established procedures 6.4 Waste materials are disposed of in accordance with ***environmental requirements***

Variable	Range
OHS policies and procedures	Arrangements of an organization or enterprise to meet their legal and ethical obligations of ensuring the workplace is safe and without risk to health. This may include: • hazardous and risk assessment mechanisms • implementation of safety regulations • safety training • safety systems incorporating, ▪ work clearance procedures ▪ isolation procedures ▪ gas and vapor ▪ monitoring/testing procedures

	▪ use of protective equipment and clothing • use of codes of practice ▪ Ethiopian electrical code
Responsible person	• Immediate supervisor • Service supervisor/manager
Materials, tools and equipment	May include but not limited to: • Conventional E-I Transformer Assembly • Copper Wires • Stranded Wires • soldering and de-soldering tools • screwdriver (assorted) • screws (assorted) • wrenches (assorted) • Allen wrench/key • utility knife/stripper • multi-tester • diodes, transistor, capacitor, resistor, transformer • pliers (assorted) • ball-peen hammer • ESD-free work bench with mirror • Calliper
Personal protective equipment	May include but not limited to: • working clothes/apron • hand gloves • face/dust mask • goggles • safety shoes
Repaired or replaced parts/components	• soldering loss contacts • rewinding low power transformer • replacing faulty components • cleaning
Environmental Requirements	• proper disposal of chemicals and components shall be based on existing requirements of the law and chemical waste management • non-biodegradable parts or materials shall be packed and labeled properly for disposal

Evidence Guide

Critical Aspects of Competence	Assessment requires evidence that the candidate: • Identified electrical/electronic components and devices and its proper handling • Applied appropriate knowledge and technique on troubleshooting • Repaired the unit according to specific requirements within timeframe allotted • Applied safety rules and procedures • Used tools and equipment properly
Underpinning Knowledge and Attitudes	• Mensuration/Mathematics ▪ Conversion of Units ▪ Applied Mathematics • Drawing, Wiring, and Schematic Diagram ▪ Reading and interpreting orthographic projections and isometric views ▪ Reading and interpreting electrical/electronic schematic diagram, wiring diagram and symbols • Safety ▪ Work Safety requirements and economy of materials with durability ▪ Knowledge in 5S application and observation of required procedures • Materials, tools/instruments & equipment uses and specifications ▪ identification of hand and power tools ▪ proper care and use of tools ▪ identification of test and measuring instruments ▪ proper care and use of test and measuring instruments • System and processes ▪ Principles of Electrical Circuits ▪ Fundamentals of Direct Current Circuits ▪ Fundamentals of Alternating Current Circuits ▪ Fundamentals of Electronic Components And Circuits ▪ Fundamentals of Digital Logic, Components & Circuits
Underpinning Skills	Demonstrates skills in: • application of troubleshooting technique • use and maintenance of test instruments, tools, & equipment • application of work safety practices and time management • application of substitution technique • soldering/de-soldering and wiring/cabling techniques • schematic diagram reading skills

Resources Implication	The following resources must be provided: • tools, equipment and test instruments • electronically-controlled domestic appliances • circuit diagrams (schematics, pictorial, wiring) • ESD free working area/bench • complete electronic spare parts/supplies
Assessment Methods	Competence may be assessed through: • Interview / written test / oral questioning • Observation/Demonstration
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Perform Basic Computer Operation**
Unit Code	**EEL BEE1 08 0511**
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
1. Plan and prepare for task to be undertaken	1.1. Requirements of task are determined according to job specifications 1.2. Appropriate ***hardware*** and ***software*** are selected according to task assigned and required outcome 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. ***Desk 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	5.1. Systems for cleaning, minor ***maintenance*** and replacement of consumables are implemented

equipment and systems	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
Variable	**Range**
Hardware and peripheral devices	• Personal computers • Networked systems • Communication equipment • Printers • Scanners • Keyboard • Mouse
Software	Software includes the following but not limited to: • Word processing packages • Data base packages • Internet • Spreadsheets
OH & S guidelines	• OHS guidelines • Enterprise procedures
Storage media	Storage media include the following but not limited to: • diskettes • CDs • zip disks • hard disk drives, local and remote
Ergonomic guidelines	• Types of equipment used • Appropriate furniture • Seating posture • Lifting posture • Visual display unit screen brightness
Desk icons	• Icons include the following but not limited to: • directories/folders • files • network devices • recycle bin
Maintenance	• Creating more space in the hard disk • Reviewing programs • Deleting unwanted files • Backing up files • Checking hard drive for errors

	• Using up to date anti-virus programs • Cleaning dust from internal and external surfaces

Evidence Guide	
Critical aspect of competence	Assessment requires evidence that the candidate: • Selected and used hardware components correctly and according to the task requirement • Identified and explained the functions of both hardware and software used, their general features and capabilities • Produced accurate and complete data in accordance with the requirements • Used appropriate devices and procedures to transfer files/data accurately • Maintained computer system
Underpinning knowledge	• Basic ergonomics of keyboard and computer use • Main types of computers and basic features of different operating systems • Main parts of a computer • Storage devices and basic categories of memory • Relevant types of software • General security • Viruses • OH & S principles and responsibilities • Calculating computer capacity
Underpinning skills	• Reading skills required to interpret work instruction • Communication skills
Method of assessment	The assessor may select two of the following assessment methods to objectively assess the candidate: • Observation / demonstration • Oral Questioning
Resource implication	• Computer hardware with peripherals • Appropriate software
Context of Assessment	Assessment may be conducted in the workplace or in a simulated environment

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Perform Housekeeping Procedures**
Unit Code	**EEL BEE1 09 0511**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to apply the basic housekeeping procedures.

Elements	Performance Criteria
1. Sort and remove unnecessary items	1.1 Reusable, recyclable materials are sorted in accordance with company/office procedures 1.2 ***Unnecessary items*** are removed and disposed of in accordance with company or office procedures
2. Arrange items	2.1 Items are arranged in accordance with company/office housekeeping procedures 2.2 Work area is arranged according to job requirements 2.3 Activities are prioritized based on instructions. 2.4 Items are provided with clear and visible ***identification marks*** based on procedure 2.5 Safety equipment and evacuation passages are kept clear and accessible based on instructions
3. Maintain work area, tools and equipment	3.1 Cleanliness and orderliness of work area is maintained in accordance with company/office procedures 3.2 Tools and equipment are cleaned in accordance with manufacturer's instructions/manual 3.3 ***Minor repairs*** are performed on tools and equipment in accordance with manufacturer's instruction/manual 3.4 Defective tools and equipment are reported to immediate supervisor
4. Follow standardized work process and procedures	4.1 Materials for common use are maintained in designated area based on procedures 4.2 Work is performed according to standard work procedures 4.3 Abnormal incidents are reported to immediate supervisor
5. Perform work spontaneously	5.1 Work is performed as per instruction 5.2 Company and office ***decorum*** are followed and complied with 5.3 Work is performed in accordance with occupational health and safety (OHS) requirements

Variable	Range
Unnecessary items	May include but are not limited to: • Non-recyclable materials • Unserviceable tools and equipment • Pictures, posters and other materials not related to work activity • Waste materials
Identification marks	• Labels • Tags • Colour coding
Decorum	• Company/ office rules and regulations • Company/ office uniform • Behavior
Minor repair	Minor repair include but not limited to: • Replacement of parts • Application of lubricants • Sharpening of tools • Tightening of nuts, bolts and screws

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Practiced the basic procedures of 5S
Underpinning Knowledge and Attitudes	• Principles of 5S • Work process and procedures • Safety signs and symbols • General OH&S principles and legislation • Environmental requirements relative to work safety • Accident/Hazard reporting procedures
Underpinning Skills	• Basic communication skills • Interpersonal skills • Reading skills required to interpret instructions • Reporting/recording accidents and potential hazards
Resource Implications	The following resources must be provided: • Facilities, materials tools and equipment necessary for the activity
Methods of Assessment	Competence must be assessed through: • Interview / Oral Questioning • Demonstration with questioning
Context for	Competence may be assessed in the work place or in a

Assessment	simulated work place setting

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Receive and Respond to Workplace Communication**
Unit Code	**EEL BEE1 10 0511**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to receive, respond and act on verbal and written communication.

elements	Performance Criteria
1. Follow routine spoken messages	1.1 Required information is gathered by listening attentively and correctly interpreting or understanding information/ instructions 1.2 Instructions/information are properly recorded 1.3 Instructions are acted upon immediately in accordance with information received 1.4 Clarification is sought from workplace supervisor on all occasions when any instruction/information is not clear
2. Perform workplace duties following written notices	2.1 ***Written notices and instructions*** are read and interpreted correctly in accordance with **organizational guidelines** 2.2 Routine written instruction are followed in sequence 2.3 Feedback is given to workplace supervisor based on the instructions/information received

Variable	Range
Written notices and instructions	Refers to : • Handwritten and printed material • Internal memos • External communications • Electronic mail • Briefing notes • General correspondence • Marketing materials • Journal articles
Organizational Guidelines	May include: • Information documentation procedures • Company policies and procedures • Organization manuals

	• Service manual

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Demonstrated knowledge of organizational procedures for handling verbal and written communications • Received and acted on verbal messages and instructions • Demonstrated competence in recording instructions/information
Underpinning Knowledge and Attitudes	• Knowledge of organizational policies/guidelines in regard to processing internal/external information • Ethical work practices in handling communications • Communication process
Underpinning Skills	• Conciseness in receiving and clarifying messages/information/communication • Accuracy in recording messages/information
Resource Implications	• Note pads • Pens
Methods of Assessment	• Direct Observation • Oral interview or written test
Context of Assessment	• Competence may be assessed individually in the actual workplace or through accredited institution

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Work with Others**
Unit Code	**EEL BEE1 11 0511**
Unit Descriptor	This unit covers the skills, knowledge and attitudes required to develop workplace relationship and contribute in workplace activities.

Elements	Performance Criteria
1. Develop effective workplace relationship	1.1 ***Duties and responsibilities*** are done in a positive manner to promote cooperation and good relationship 1.2 Assistance is sought from ***workgroup*** when difficulties arise and addressed through discussions 1.3 ***Feedback*** provided by others in the team is encouraged, acknowledged and acted upon 1.4 Differences in personal values and beliefs are respected and acknowledged in the development
2. Contribute to work group activities	2.1 ***Support is provided to team members*** to ensure workgroup goals are met 2.2 Constructive contributions to workgroup goals and tasks are made according to ***organizational requirements*** 2.3 Information relevant to work is shared with team members to ensure designated goals are met

Variable	Range
Duties and responsibilities	• Job description and employment arrangements • Organization's policy relevant to work role • Organizational structures • Supervision and accountability requirements including OHS • Code of conduct
Work group	• Supervisor or manager • Peers/work colleagues • Other members of the organization

Feedback on performance	• Formal/Informal performance appraisal • Obtaining feedback from supervisors and colleagues and clients • Personal, reflective behavior strategies • Routine organizational methods for monitoring service delivery
Providing support to team members	• Explaining/clarifying • Helping colleagues • Providing encouragement • Providing feedback to another team member • Undertaking extra tasks if necessary
Organizational requirements	• Goals, objectives, plans, system and processes • Legal and organization policy/guidelines • OHS policies, procedures and programs • Ethical standards • Defined resources parameters • Quality and continuous improvement processes and standards

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Provided support to team members to ensure goals are met • Acted on feedback from clients and colleagues • Accessed learning opportunities to extend own personal work competencies to enhance team goals and outcomes
Underpinning Knowledge and Attitude	• The relevant legislation that affects operations, especially with regards to safety • Reasons why cooperation and good relationships are important • Knowledge of the organization's policies and procedures • Understanding how to elicit and interpret feedback • Knowledge of workgroup member's responsibilities and duties • Importance of demonstrating respect and empathy in dealings with colleagues • Understanding of how to identify and prioritize personal

	development opportunities and options
Underpinning Skills	• Ability to read and understand the organization's policies and work procedures • Write simple instructions for particular routine tasks • Interpret information gained from correspondence • Communication skills to request advice, receive feedback and work with a team • Planning skills to organized work priorities and arrangement • Technology skills including the ability to select and use technology appropriate to a task • Ability to relate to people from a range of social, cultural and ethnic backgrounds.
Resource Implications	• Access to relevant workplace or appropriately simulated environment where assessment can take place • Materials relevant to the proposed activity or task
Methods of Assessment	Competence may be assessed through: • Direct observations of work activities of the individual member in relation to the work activities of the group • Observation of simulation and/or role play involving the participation of individual member to the attainment of organizational goal
Context of Assessment	Competence may be assessed in workplace or in a simulated workplace setting

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Demonstrate Work Values**
Unit Code	**EEL BEE1 12 0511**
Unit Descriptor	This unit covers the knowledge, skills, and attitude in demonstrating proper work values.

Elements	Performance Criteria
1. Define the purpose of work	1.1 One's unique sense of purpose for working and the 'whys' of work are identified, reflected on and clearly defined for one's development as a person and as a member of society 1.2 Personal mission is in harmony with company's values
2. Apply work values/ethics	2.1 ***Work values/ethics/concepts*** are classified and reaffirmed in accordance with the transparent company ethical standards, policies and guidelines 2.2 ***Work practices*** are undertaken in compliance with industry work ethical standards, organizational policy and guidelines 2.3 Personal behavior and relationships with co-workers and/or clients are conducted in accordance with ethical standards, policy and guidelines 2.4 ***Company resources*** are used in accordance with transparent company ethical standard, policies and guidelines
3. Deal with ethical problems	3.1 Company ethical standards, organizational policy and guidelines on the prevention and reporting of unethical conduct are accessed and applied in accordance with transparent company ethical standard, policies and guidelines 3.2 ***Work incidents/situations*** are reported and/or resolved in accordance with company protocol/guidelines. 3.3 Resolution and/or referral of ethical problems identified are used as learning opportunities
4. Maintain integrity of conduct in the workplace	4.1 Personal work practices and values are demonstrated consistently with acceptable ethical conduct and company's core values 4.2 ***Instructions*** to co-workers are provided based on ethical, lawful and reasonable directives 4.3 Company values/practices are shared with co-workers using appropriate behaviour and language

Variable	Range
Work values/ethics/ concepts	May include but are not limited to: • commitment/ dedication • sense of urgency • sense of purpose • love for work • high motivation • orderliness • reliability and dependability • competence • goal-oriented • sense of responsibility • being knowledgeable • loyalty to work/company • sensitivity to others • compassion/caring attitude • balancing between family and work • sense of nationalism
Work practices	• Quality of work • Punctuality • Efficiency • Effectiveness • Productivity • Resourcefulness • Innovativeness/Creativity • Cost consciousness • 5S • Attention to details
Incidents/situations	• Violent/intense dispute or argument • Gambling • Use of prohibited substances • Pilferages • Damage to person or property • Vandalism • Falsification • Bribery • Sexual Harassment • Blackmail

Company resources	• Consumable materials • Equipment/Machineries • Human • Time • Financial resources
Instructions	• Verbal • Written

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Defined one's unique sense of purpose for working • Clarified and affirmed work values/ethics/concepts consistently in the workplace • Demonstrated work practices satisfactorily and consistently in compliance with industry work ethical standards, organizational policy and guidelines • Demonstrated personal behavior and relationships with co-workers and/or clients consistent with ethical standards, policy and guidelines • Used company resources in accordance with company ethical standard, policies and guidelines. • Followed company ethical standards, organizational policy and guidelines on the prevention and reporting of unethical conduct/behavior
Underpinning Knowledge	• Occupational health and safety • Work values and ethics • Company performance and ethical standards • Company policies and guidelines • Fundamental rights at work including gender sensitivity • Work responsibilities/job functions • Corporate social responsibilities • Company code of conduct/values • Balancing work and family responsibilities
Underpinning Skills	• Interpersonal skills • Communication skills • Self awareness, understanding and acceptance • Application of good manners and right conduct

Resource Implications	The following resources must be provided: • Workplace or assessment location • Case studies/Scenarios
Methods of Assessment	Competence may be assessed through: • Oral questioning / Interview • Demonstration/Observation
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Apply Quality Standards**
Unit Code	**EEL BEE1 13 0511**
Unit Descriptor	This unit covers the skills and knowledge required in applying quality standards in servicing works.

Elements	Performance Criteria
1. Assess own work	1.1 Completed work is checked against workplace standards relevant to the operations/process being undertaken 1.2 An understanding is demonstrated on how the work activities and completed work relate to the next process and to the final functionality of the component/unit 1.3 Faulty parts or materials are identified and isolated in accordance with company policies and procedures 1.4 Faults and any identified causes are recorded and reported in accordance with workplace procedures
2. Assess quality of received articles	2.1 Received materials or component parts are ***checked*** against workplace standards and specifications for such things as size, alignment and finish/functionality 2.2 Materials or component parts are measured using the appropriate measuring instruments in accordance with workplace procedures 2.3 An understanding is demonstrated of how the received materials or component parts relate to the current operation and how they contribute to the final appearance the system/unit 2.4 Faulty material or component parts related to the service work are identified and isolated 2.5 Where required, the faults and any identified causes are recorded and/or reported to the supervisor concerned in accordance with workplace procedures 2.6 Causes of any identified faults are identified and corrective actions are taken in accordance with workplace procedures
3. Record information	3.1 Materials, component parts or tolerances are measured, as required, using the appropriate measuring instruments in accordance with workplace procedures 3.2 Basic information on the quality performance is recorded in accordance with workplace procedures

	3.3 Records of work quality are maintained according to the requirements of the company
4. Study causes of quality deviations	4.1 Causes of deviations from specified quality standards for materials, component parts or final service rendered are investigated and reported, as required, using the appropriate measuring techniques in accordance with workplace procedures 4.2 Suitable preventive action is recommended based on workplace ***quality standards*** and identified causes of deviation from specified quality standards of materials or final service rendered/functionality of work done
5. Complete documentation	5.1 Information on quality and other indicators of performance is recorded. 5.2 All processes and outcomes are recorded.

Variable	**Range**
Quality check	• Visual inspection • Physical measurements • Functionality • Check against design/specifications
Quality standards	• Materials • Component parts • Final service rendered • Methods/processes
Quality parameters	• Finish • Size • Durability • Process variations • Materials • Alignment • Color • Damage and imperfections
Sources of information/ documents	may include but not limited to • quality and Ethiopian standards and procedures • work instructions, patterns and designs • organization work procedures • manufacturer's instructions for materials and equipment • organizational or external personnel • customer/s requirements

Evidence Guide	

Critical Aspects of Competence	Assessment requires evidence that the candidate:
	• Checked completed work continuously against workplace standard
	• Identified faulty pieces or final construction
	• Checked received materials, component parts or materials against workplace standards
	• Identified and applied corrective actions on the causes of identified faults
	• Measured materials or component parts
	• Recorded basic information regarding quality performance
	• Investigated causes of deviations of materials against standard
	• Recommended suitable preventive actions
	• Assessment must confirm appropriate knowledge and skills to:
	  • interpret, relevant work instructions, standards and specifications appropriate to the tasks
	  • check and measure the relevant quality parameters
	  • interpret the results of quality checks in terms of specifications, patterns and work standards
	  • take required action where standards of materials, component parts, work processes are found to be unacceptable
	  • maintain accurate records

Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • relevant quality standards, policies and procedures • relevant processes, materials and products/services • characteristics of materials used • safety environment aspects of service processes • relevant measurement techniques and quality checking procedures • workplace procedures • reporting procedures
Underpinning Skills	Demonstrate skills in: • Interpret work instructions, specifications, standards and patterns appropriate to the required work • Carry out relevant visual inspections of materials, component parts and final service • Carry out relevant physical measurements • Maintain accurate work records in accordance with

	procedures • Meet work specifications • Communicate effectively within defined workplace procedures • carry out work in accordance with OHS policies and procedures • interpret and apply defined procedures

Resource Implications	The following resources should be provided:
	• Access to real or appropriately simulated situations including:
	  • areas, materials, equipment
	  • information on work specifications/patterns,
	  • relevant safety procedures and regulations,
	  • quality standards, organization procedures
	  • customer requirements

Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context for Assessment	Competence may be assessed in the workplace or in a simulated workplace setting

TOP

Occupational Standard: Basic Electrical/Electronic Equipment Servicing Level I	
Unit Title	**Develop Understanding of Entrepreneurship**
Unit Code	**EEL BEE1 14 0511**
Unit Descriptor	This unit covers skills, knowledge and attitude required to understand the principles, functions, strategies and methods of entrepreneurship. It also covers identifying and developing the major entrepreneurial competences.

Elements	Performance Criteria
1. Describe and explain the principles, concept and scope of entrepreneurship	1.1 The principles, concept and terminology of entrepreneurship are analyzed and discussed 1.2 The different / various forms of enterprises in the community are identified and their roles understood 1.3 The identified enterprises are categorized and ***classified*** 1.4 The terms and elements involved in the concept of enterprising, both on a personal level and in the context of being enterprising in business are identified and interpreted 1.5 Functions of entrepreneurship in business and how the entrepreneurs improved business and economic environment are explained
2. Discuss how to become entrepreneur	2.1 Self-employment as an alternative option for an individual economic independence and personal growth is discussed and analyzed 2.2 Advantages and disadvantages of self-employment are discussed and explained 2.3 Entrepreneurial characteristics and traits are identified and discussed 2.4 Self-potential is assessed to determine if qualified to become future entrepreneur 2.5 Major competences of successful entrepreneurship are identified and explained
3. Discuss how to organize an enterprise	3.1 The importance and role of business entrepreneurship in the society are discussed and correlated to the operations of the economy 3.2 Facts about small and medium enterprises are discussed, clarified and understood

	3.3 Key success factor in setting up small and medium business are identified and explained 3.4 Business opportunities are identified and assessed 3.5 Business ideas are generated using appropriate tools, techniques and steps 3.6 Procedures for identifying suitable market for business are discussed and understood 3.7 ***Major factors*** to consider in selecting a location for a business are identified and discussed 3.8 Basic types of business ownership are identified and explained 3.9 Amount of money needed to start an enterprise estimated and distinction between pre operations and initial operation payments clarified 3.10 Advantages and disadvantages of using various sources of capital to start an enterprise are identified
4. Discuss how to operate an enterprise	4.1 Disadvantages and advantages of ***three alternative*** means of becoming an entrepreneur are identified and understood 4.2 Process of hiring and managing people is discussed and explained 4.3 The importance and techniques of managing time are discussed and understood 4.4 The techniques and procedures of managing sales are discussed and explained 4.5 Factors to consider in selecting suppliers and the steps to follow when doing business with them are identified and discussed 4.6 Awareness of how new technologies can affect small and medium business are developed 4.7 Characteristics of appropriate technology for use in small and medium business are identified and explained 4.8 Different types of cost that occur in a business and how to manage them are discussed and understood 4.9 Factors and procedures in knowing the cost of the enterprise are discussed and understood 4.10 Importance of financial record keeping and preparing simple financial statement are explained and understood 4.11 The application of self-management skills and negotiation

	skills are discussed in operating a business 4.12 Risk assessment and management of business enterprise are performed
5. Develop one's own business plan	5.1 Process of preparing/ writing a business plan is discussed and applied 5.2 Standard structure and format are applied in preparing business plan 5.3 Findings of the business plan are interpreted, assessed and analyzed 5.4 Feasibility of the business idea is made clear and understandable 5.5 Problems that may arise or encounter when starting a business are identified and understand 5.6 Techniques and procedures in obtaining and sourcing information are discussed and understood

Variables	**Range**
Classification	• Private vs public • Profit vs non-profit • Formal vs Non-formal • Individual vs Community • Local vs Foreign • Business vs Social • Small vs Large • Manufacturing vs Service • Consumer vs Industrial
Major factors	• Economics (local economy) • Population • competition
Three alternative	• Buying an existing business • Starting a new business • Operating a franchising business

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • explained principles and concept of entrepreneurship • discussed how to become entrepreneur • discussed how to organize an enterprise

	• discussed how to operate an enterprise • develop business plan
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Entrepreneurship principles, concepts and terminologies • Entrepreneurial competence • Entrepreneurial motivation • Risk assessment and evaluation • Principles and process of negotiations • Self-management and self-employment • Managing sales, people and time • Factors in setting up small and medium business • Small and Medium Enterprise • Business plan development • Discussion techniques and procedures
Underpinning Skills	Demonstrate skills in: • Planning and Leading • Presentation skills • Using technology • Managing money • Preparing simple financial statement • Selecting suppliers
Resource Implications	The following resources must be provided: • Tools, equipment and facilities appropriate to the proposed activities • Materials relevant to the proposed activities
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Demonstration/ Direct Observation with Oral Questioning
Context of Assessment	Competency may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Basic Electrical/Electronics Equipment Servicing Level I	
Unit Title	**Apply 5S Procedures**
Unit Code	**EEL BEE1 15 1012**
Unit Descriptor	This unit of competence covers the skills, attitudes and knowledge required by an employee or worker to apply 5S procedures (structured approach to housekeeping) to their own job and work area and maintains the housekeeping and other standards set by 5S. The unit assumes the employee or worker has a particular job and an allocated work area and that processes in the work area are known by the individual.

Elements	Performance Criteria
1. Develop understanding of quality system	1.1 Discuss quality assurance procedures of the enterprise or organization 1.2 Understand the relationship of quality system and continuous improvement in the workplace 1.3 Identify and relate to workplace requirements the purpose and ***elements*** of quality assurance (QA) system 1.4 Explain the ***5S system*** as part of the quality assurance of the work organization
2. Sort needed items from unneeded	2.1 Identify all ***items*** in the work area 2.2 Distinguish between essential and non-essential items 2.3 Sort items to achieve deliverables and value expected by downstream and final customers 2.4 Sort items required for regulatory or other required purposes 2.5 Place any non-essential item in a appropriate place other than the workplace 2.6 Regularly check that only essential items are in the work area
3. Set workplace in order	3.1 Identify the best location for each essential item 3.2 Place each essential item in its assigned location 3.3 After use immediately return each essential item to its assigned location 3.4 Regularly check that each essential item is in its assigned location
4. Shine work area	4.1 Keep the work area clean and tidy at all times 4.2 Conduct regular housekeeping activities during shift 4.3 Ensure the work area is neat, clean and tidy at both beginning and end of shift

5. Standardize activities	5.1 Follow ***procedures*** 5.2 Follow checklists for activities, where available 5.3 Keep the work area to specified standard
6. Sustain 5S system	6.1 Clean up after completion of job and before commencing next job or end of shift 6.2 Identify situations where compliance to standards is unlikely and take actions specified in procedures 6.3 Inspect work area regularly for compliance to specified standard 6.4 Recommend improvements to lift the level of compliance in the workplace

Variable	**Range**
Elements of QA system	• corrective action • mission statements • monitoring procedures • SOPs • work instructions • PDCA concept
5S	5S is a system of work organization originally developed in Japan based around housekeeping principles. A close translation of the five stages in the housekeeping approach is: • sort • set in order • shine • standardize • sustain Japanese terms: • seiri - eliminating everything not required for the work being performed (sort) • seiton - efficient placement and arrangement of equipment and material (set in order) • seison - tidiness and cleanliness (shine) • seiketsu - ongoing, standardised, continually improving seiri, • seiton, seison • shitsuke - discipline with leadership
Items in the work area	Includes: • tools • jigs/fixtures • materials/components • plant and equipment • manuals

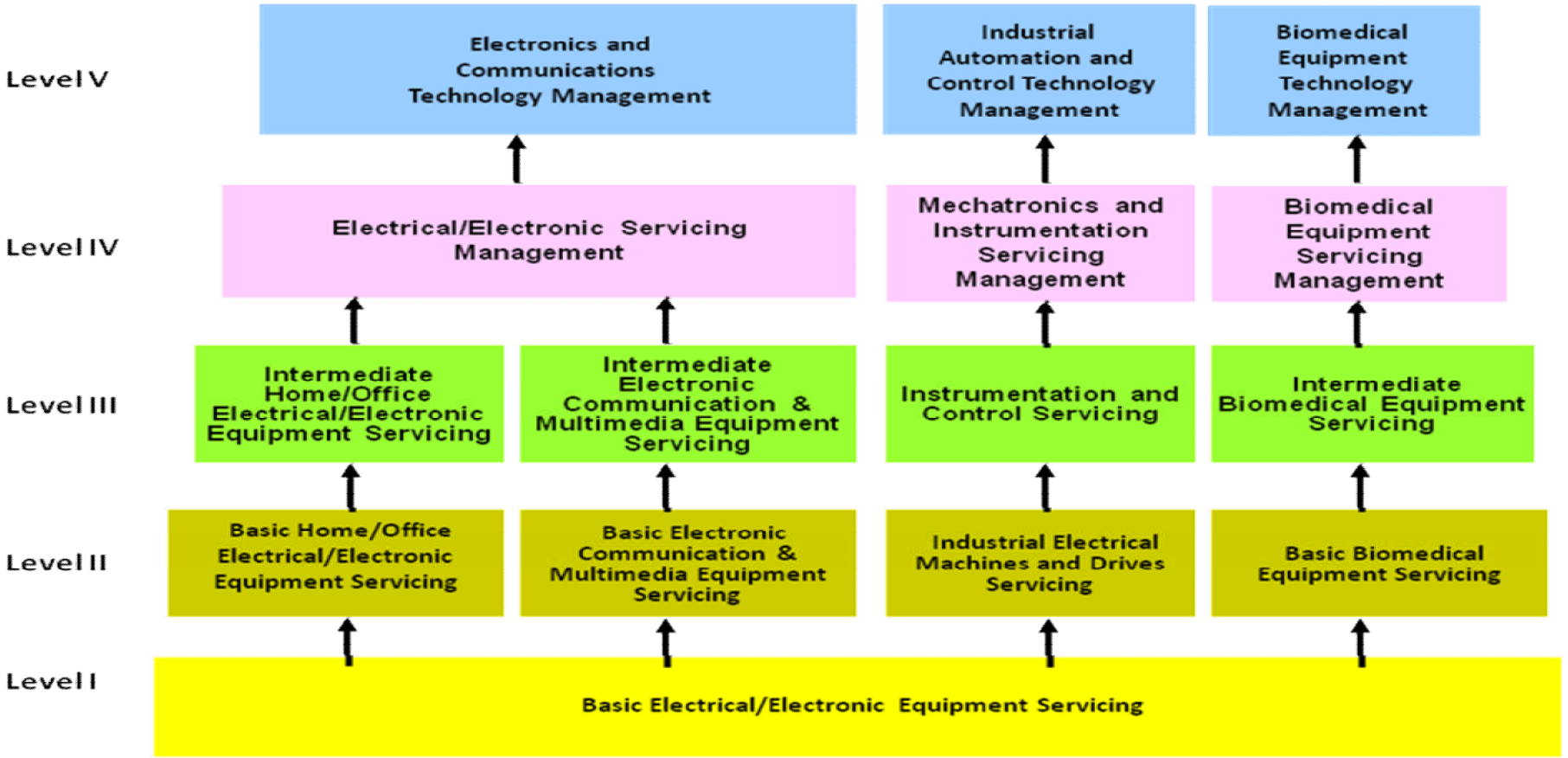
	• personal items (e.g. bags, lunch boxes and posters) • safety equipment and personal protective equipment • other items which happen to be in the work area
Sort	Sort involves keeping only what is absolutely necessary for the processes in the work area. Sort includes: • clearing the work area of all non-essential equipment and materials Non-essential items are those not required to either produce product, conduct process or operations, or make required adjustments to equipment during process or operations
Set in order	After removing unnecessary materials, the remaining materials must be those that are required immediately for either the machine or the job at hand. All of these materials/change/parts etc must have an assigned location on the production floor. Locations should be clearly marked and labeled to show what belongs where. assigning required equipment and materials appropriate locations in the work area
Shine	includes: • keeping the work area clean at all times • this should be carried out to a regular daily schedule against allowed time and, on most occasions, at the end of a job
Standardize	Once 5S is established, standardizing activities help maintain the order and the housekeeping standards. Standardizing may use procedures and checklists developed from a procedure. Standardizing includes: • activities that help maintain the order and the housekeeping standards • using procedures and checklists developed from a procedure • OHS measures such as signage, symbols / coding and labeling of work area and equipment
Procedures	Procedures may include: • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the operation of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) and government regulations Procedures may be: • written, verbal, computer based or in some other format

Sustain	includes: • making sure that daily activities are completed every day regardless of circumstance • cleaning up after a job • undertaking inspections, including: – informal inspections carried out often, at least weekly – formal inspections carried out at least monthly • generating continuous improvement actions from daily activities • following up specific actions to generate continuous improvement

Evidence Guide	
Critical Aspects of Competence	A person who demonstrates competence in this unit must be able to provide evidence of the ability to: • identify own tasks and responsibilities and relate them to organization and customer requirements • identify and explain the stages of 5S • implement 5S in own work area • identify waste (muda) in the work area • routine practice of 5S as part of their job
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • operations and processes relevant to own job • basic principle of quality assurance system and its elements • quality procedures and continuous improvement (kaizen) • meaning and application of 5S steps to own job and work area • principles of efficient workplace organization • purposes of 5S • methods of making/recommending improvements
Underpinning Skills	Demonstrates skills to: • communicating with others to clarify issues during 5S implementation, communicate results and contribute suggestions for improvement • visualizing operations in terms of flow and contribution to customer outcomes • planning own tasks in implementation of 5S • implementing 5S in own work area according to instructions • identifying waste (muda) • organizing, prioritizing activities and items • reading and interpreting documents describing procedures • recording activities and results against templates and other prescribed formats • working with others • solving problems

Resources Implication	Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the candidate • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies
Methods of Assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting. Assessment of performance must be undertaken in a workplace using or implementing 5S as competitive systems and practices.

Sector: Electrotechnology and Telecommunication
Sub-Sector: Electrotechnology



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