Model Curriculum

QP Name: Multi Skill Technician (Electrical)

QP Code: ELE/Q3115

QP Version: 2.0

NSQF Level: 4

Model Curriculum Version: 2.0

Electronics Sector Skills Council of India || 155, 2nd Floor, ESC House, Okhla Industrial Area- Phase 3, NewDelhi - 110020

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Training Parameters

Sector	Electronics
Sub-Sector	Consumer Electronics
Occupation	After Sales Service
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7412.0202
Minimum Educational Qualification & Experience	8th Grade Pass + NTC (2 years after 8th) + 2 Year NAC/relevant Experience) OR 10th Grade pass + 2 Year NTC/NAC/ relevant experience OR Certificate-NSQF (Level-3 in Maintenance Technician) with 2 Years of relevant Experience OR 12th Class and 18 Years
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	30/12/2021
Next Review Date	30/12/2024
NSQC Approval Date	30/12/2021
Version	2.0
Model Curriculum Creation Date	30/12/2021
Model Curriculum Valid Up to Date	30/12/2024
Model Curriculum Version	2.0
Maximum Duration of the Course	600 Hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

Compulsory:

- Diagnose faults and repair home appliances such as LED lights, geyser and fans
- Perform steps of installation and repair of water purifier
- Diagnose faults and repair mixer/juicer/grinder
- Organize work and resources as per health and safety standards
- Implement effective ways of communication while being sensitive of gender and PwDs

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	**06:00**	**04:00**	**00:00**	**00:00**	**10:00**
Module 1: Role and Responsibilities of a Multi Skill Technician (Electrical)	06:00	04:00	00:00	00:00	10:00
ELE/N3147 – Engage with customer for service	**10:00**	**20:00**	**30:00**	**00:00**	**60:00**
Module 2: Interact with customers	10:00	20:00	30:00	00:00	60:00
ELE/N3148 – Diagnose and repair faults in LED lights	**30:00**	**60:00**	**30:00**	**00:00**	**120:00**
Module 3: Prepare for diagnosing and repairing faults in LED lights	30:00	60:00	30:00	00:00	120:00
ELE/N3149 – Diagnose and fix faults in geyser and fans	**30:00**	**30:00**	**30:00**	**00:00**	**90:00**

Module 4: Prepare for diagnosing and repairing faults in geysers and fans	30:00	30:00	30:00	00:00	90:00
ELE/N3150 – Install new and repair dysfunctional water purifier	**20:00**	**60:00**	**30:00**	**00:00**	**110:00**
Module 5: Prepare for installing and repairing the water purifier	20:00	60:00	30:00	00:00	110:00
ELE/N3151 – Repair dysfunctional mixer/juicer/grinder	**30:00**	**30:00**	**30:00**	**00:00**	**90:00**
Module 6: Prepare for repairing the mixer/juicer/grinder	30:00	30:00	30:00	00:00	90:00
ELE/N9905 Work effectively at the workplace	**15:00**	**15:00**	**00:00**	**00:00**	**30:00**
Module 7: Soft Skills and Work Ethics	15:00	15:00	00:00	00:00	30:00
ELE/N1002 Apply health and safety practices at workplace	**15:00**	**15:00**	**00:00**	**00:00**	**30:00**
Module 8: Basic Health and Safety Practice	15:00	15:00	00:00	00:00	30:00
DGT/VSQ/N0102- Employability Skills (60 Hours)	**24:00**	**36:00**	**00:00**	**00:00**	**60:00**
Module 9: Employability Skills (60 Hours)	24:00	36:00	00:00	00:00	60:00
Total Duration	**180:00**	**270:00**	**150:00**	**00:00**	**600:00**

Module Details

Module 1: Role and Responsibilities of a Multi Skill Technician (Electrical)

Bridge Module

Terminal Outcomes:

- Identify the role and responsibilities of a Multi Skill Technician (Electrical).

Duration: *06:00*	**Duration**: *04:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the size and scope of the electronics industry and its sub-sectors. • Explain the roles and responsibilities of a Multi Skill Technician (Electrical). • Describe various employment opportunities for a Multi Skill Technician (Electrical) in the electronics industry. • Explain the organisational policies on incentives, personnel management, and quality standards. • Discuss the importance of following standard organizational work process. • Describe the organisational code of conduct, reporting structure and the documentation procedure practised within the organisation.	• Operate different types of appliances such as LED, geyser, fans,mixer/juicer/grinder,water purifier of the company • Demonstrate effective ways of communication to interact with customers
Classroom Aids:	
Training kit (Trainer guide, Presentations)	
Tools, Equipment and Other Requirements	

Module 2: Interact with Customers

Mapped to ELE/N3147

Terminal Outcomes:

Communicate with the customers and understand their requirements for initiating relevant solutions

Duration: *10:00*	**Duration**: *20:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the organizational hierarchy and process to collect work order/job sheet from the supervisor. • List the important factors to consider while making a visit plan for the day • Discuss the common problems in operating an appliance, its causes and solutions. • Discuss the best practices to complete quality work on time and achieve customer satisfaction	• Perform a role play on how to call and communicate with customer to understand their requirements • Prepare a checklist of the tools & equipment and documents to be carried to customer location • Perform a visual inspection to check the warranty and problem of the appliance after confirming it with the consumer • Prepare a sample reference sheet for enlisting causes and solutions of problems along with the applicable costs • Perform the steps such as resistance, earthing, voltage check ,current check etc. to test the performance of the appliance after fixing it • Prepare a sample invoice in an organizational format to collect payment from the customer
Classroom Aids:	
Training kit (Trainer guide, Projector), pen, paper, duster, marker etc.	
Tools, Equipment and Other Requirements	
Sample warranty form	

Module 3: Prepare for diagnosing and repairing faults in LED lights

Mapped to ELE/N3148

Terminal Outcomes:

- Diagnose faults in LED light
- Repair faulty LED lights

Duration: *30:00*	**Duration**: *60:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the basic inspection process of LED light. • Discuss the common issues and faults that may occur in an LED light • Explain the process of comparing actual voltage with the desired voltage to find out the damaged section of supply using multimeter • State the importance of checking and replacing the damaged LED strips • List the parameters to check and ensure functioning of the LED lights • Describe the importance of following safety precautions while handling the appliances	• Perform the steps to solder wires and make connections of loose wires to make them functional • Perform the steps to check the LED light engine and repair/replace it with the DC supply, if found faulty • Demonstrate how to repair and replace the damaged component and ensure its functioning • Check the performance of LED light after repairing and re-assembling it • Demonstrate how to fix LED light at the required fixture and check its functioning again
Classroom Aids:	
Training kit (Trainer guide, Projector), pen, paper, duster, marker etc.	
Tools, Equipment and Other Requirements	
Electronic device under test; electronic modules, circuits; relevant documents in the form of drawings, work manuals, wiring specifications; LED, multi meter, tester, LCR meter, power analyser, ICs and personal protective equipment (PPE).	

Module 4: Prepare for diagnosing and repairing faults in geyser and fans

Mapped to ELE/N3149

Terminal Outcomes:

- Diagnose faults in geyser or fan
- Repair faulty geyser or fan

Duration: *0:00*	**Duration**: *30:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• State the importance of providing and ensuring correct voltage output and proper connectivity • Outline the organizational hierarchy to inform the supervisor about component non-availability, damage etc. • Discuss the guidelines of a service manual to be followed by a technician while testing • Highlight the best practices to be followed to clean the repair area • Explain the importance of team work and helping colleagues, if required	• Perform the steps of basic tests to check fundamental components of geyser and fan functioning • Demonstrate how to perform functional tests on geyser/fan components after disassembling it • Perform Troubleshooting procedure of minor external faults such as loose connections, improper mounting, etc. • Role play on how to operate the appliance and explain appliance functioning to the consumer • Prepare sample documents to close customer complaint and receive payment
Classroom Aids:	
Training kit (Trainer guide, Projector), pen, paper, duster, marker etc.	
Tools, Equipment and Other Requirements	
Electronic device under test; electronic modules, circuits; relevant documents in the form of drawings, work manuals, wiring specifications; LED, multi meter, tester, LCR meter, power analyser, ICs and personal protective equipment (PPE).	

Module 5: Install new and repair dysfunctional water purifier

Mapped to ELE/N3150

Terminal Outcomes:

- Perform pre-installation of water purifier.
- Install and check functionality of the water purifier.
- Diagnose faults and fix dysfunctional components.

Duration: *20:00*	**Duration**: *60:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the organizational work process to collect work order/job sheet from the supervisor. • Discuss the importance of placing necessary markings for purifier installation to avoid repeated visits at the customer place • State the procedure of opening and disposing purifier packaging and using appropriate tools and equipment • Describe the purifier maintenance issues and their solutions • State the importance of following safety and cleanliness precautions at the customer place • Explain the process of replacing or repairing the faulty component in a water purifier	• Demonstrate ways of effective communication to interact with the customer about installation and fault • Check the structural requirements to decide an appropriate location for water purifier location • Devise ways to find out the pre-installation and water pressure requirements at the customer location • Perform the steps to install the water purifier as per the installation manual • Operate the water purifier to test its functioning and demonstrate its utility • Perform the steps of purifier fault identification, if any
Classroom Aids:	
Training kit (Trainer guide, Projector), pen, paper, duster, marker etc.	
Tools, Equipment and Other Requirements	
Water purifier, repair tools, spare parts of water purifier, flow diagrams	

Module 6: Prepare for repairing the mixer/juicer/grinder

Mapped to ELE/N3151

Terminal Outcomes:

- Diagnose faults and repair/replace dysfunctional parts.
- Test appliance functionality after job completion.

Duration: *30:00*	**Duration**: *30:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• State the organizational procedure of initial inspection of faulty mixer/juicer/grinder. • List the reasons and conditions due to which faulty module needs to be sent to factory • Discuss some best and ideal cleaning practices to maintain the equipment in best condition • State the procedure of completing documentation procedure and closing the complaint	• Operate different models of mixers and grinders as per the requirement • Perform basic tests for power supply, voltage and earthing of wires • Demonstrate how to replace faulty module/component at the customer site • Demonstrate the functionality of fixed equipment to check its operationing
Classroom Aids:	
Training kit (Trainer guide, Projector), pen, paper, duster, marker etc.	
Tools, Equipment and Other Requirements	
Mixer, grinder, juicer, repair tools, sample customer feedback form,	

Module 7: Soft Skills and Work Ethics

Mapped to ELE/N9905

Terminal Outcomes:

- Work effectively at the workplace.
- Implement the practices related to gender and PwD sensitization

Duration: *15:00*	**Duration**: *15:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• State the importance of work ethics and workplace etiquette • State the importance of effective communication and interpersonal skills. • Explain ways to maintain discipline at the workplace. • Discuss the common reasons for interpersonal conflict and ways of managing them effectively. • Discuss the importance of following organisational guidelines for dress code, time schedules, language usage and other behavioural aspects. • Explain the importance of working as per the workflow of the organisation to receive instructions and report problems. • Explain the importance of conveying information/instructions as per defined protocols to the authorised persons/team members. • Explain the common workplace guidelines and legal requirements on non-disclosure and confidentiality of business-sensitive information. • Describe the process of reporting grievances and unethical conduct such data breach, sexual harassment at the workplace, etc. • Explain the concept and importance of gender sensitivity and equality. • Discuss ways to create sensitivity for different genders and Persons with Disabilities (PwD). • Discuss ways of dealing with	• Develop a sample plan to achieve organisational goals and targets. • Create a sample feedback form to obtain feedback from customers, colleagues etc. • Roleplay to demonstrate the use of professional language and behaviour that is respectful of PwD and all genders. • Apply organisational protocol on data confidentiality and sharing only with the authorised personnel.

heightened emotions of self and others.	
Classroom Aids	
Training kit (Trainer guide, Presentations)	
Tools, Equipment and Other Requirements	
Sample of escalation matrix, organization structure.	

Module 8: Basic Health and Safety Practice

Mapped to ELE/N1002

Terminal Outcomes:

- Apply health and safety practices at the workplace.

Duration: *15:00*	**Duration**: *15:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss job-site hazards, risks and accidents. • Explain the organizational safety procedures for maintaining electrical safety, handling tools and hazardous materials. • Elaborate electronic waste disposal procedures. • Describe the process of disposal of hazardous waste • List the name and location of concerned people, documents and equipment for maintaining health and safety in the workplace. • Describe how to interpret warning signs while accessing sensitive work areas. • Explain the importance of good housekeeping. • Describe the importance of maintaining appropriate postures while lifting heavy objects. • List the types of fire and fire extinguishers. • Explain the importance of efficient utilisation of water, electricity and other resources. • List the common sources of pollution and ways to minimize it. • Describe the concept of waste management and methods of disposing hazardous waste. • Explain various warning and safety signs. • Describe different ways of preventing accidents at the	• Demonstrate the use of protective equipment suitable as per tasks and work conditions. • Prepare a report to inform the relevant authorities about any abnormal situation/behaviour of any equipment/system. • Administer first aid in case of a minor accident. • Demonstrate the steps to free a person from electrocution safely. • Administer Cardiopulmonary Resuscitation (CPR). • Demonstrate the application of defined emergency procedures such as raising alarm, safe/efficient, evacuation, moving injured people, etc. • Prepare a sample incident report. • Use a fire extinguisher in case of a fire incident. • Demonstrate the correct method of lifting and handling heavy objects.

workplace.	
Classroom Aids	
Training kit (Trainer guide, Presentations)	
Tools, Equipment and Other Requirements	
Personal Protection Equipment: safety glasses, head protection, rubber gloves, safety footwear, warning signs and tapes, fire extinguisher, first aid kit, fire extinguishers and warning signs.	

Module 9: Employability Skills (60 Hours)

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Discuss about Employability Skills in meeting the job requirements
- Describe opportunities as an entrepreneur.
- Describe ways of preparing for apprenticeship & Jobs appropriately.

Duration: 24:00	Duration: 36:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain constitutional values, civic rights, responsibility towards society to become a responsible citizen • Discuss 21st century skills • Explain use of basic English phrases and sentences. • Demonstrate how to communicate in a well-behaved manner • Demonstrate how to work with others • Demonstrate how to operate digital devices • Discuss the significance of Internet and Computer/ Laptops • Discuss the need for identifying business opportunities • Discuss about types of customers. • Discuss on creation of biodata • Discuss about apprenticeship and opportunities related to it.	• List different learning and employability related GOI and private portals and their usage • Show how to practice different environmentally sustainable practices. • Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, etc. • Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone • Demonstrate how to communicate in a well-mannered way with others. • Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette • Utilize virtual collaboration tools to work effectively • Demonstrate how to maintain hygiene and dressing appropriately. • Perform a mock interview
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Computer, UPS, Scanner, Computer Tables, LCD Projector, Computer Chairs, White Board OR Computer Lab	

Module 10: On-the-Job Training

Mapped to Multi-Skill Technician (Electrical)

Mandatory Duration: *150:00*	**Recommended Duration**: *00:00*
Location: On Site	

Terminal Outcomes

1. Explain the fundamental concepts of electronics and electronics components
2. Demonstrate the correct way to interact with a customer at their location
3. Perform the diagnosing and repairing of faults in LED lights
4. Demonstrate the testing, diagnosing faults and repairing of home appliances such as geyser or fan
5. Illustrate the installation and repair process of dysfunctional water purifier
6. Test the functioning of mixer/juicer/grinder after repairing the faults
7. Interact and coordinate with supervisor and colleagues
8. Work as per the given timeline and quality standards
9. Maintain a safe, healthy and secure work environment
10. Develop a business plan and resolve the common issues

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Diploma/ ITI/ Certified in relevant CITS course	Electronics/Electrical/ Mechanical	1	Electrical Technician	1	Electronics	

Trainer Certification	
Domain Certification	**Platform Certification**
"Multi Skill Technician (Electrical)", "ELE/Q3115, v2.0", Minimum accepted score is 80%	Recommended that the Trainer is certified for the **Multi Skill Technician (Electrical)**"Trainer (VET and Skills)", mapped to the Qualification Pack: "MEP/Q2601, V2.0", with minimum score of 80%

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Diploma/ ITI/ Certified in relevant CITS course	Electronics/Electrical/ Mechanical	2	Electrical Technician	1	Electronics	

Assessor Certification	
Domain Certification	**Platform Certification**

"Multi Skill Technician (Electrical)", "ELE/Q3115, v2.0", Minimum accepted score is 80%	Recommended that the Assessor is certified for the **Multi Skill Technician (Electrical)**"Assessor (VET and Skills)", mapped to the Qualification Pack: "MEP/Q2701, V2.0", with minimum score of 80%

Assessment Strategy

1. Assessment System Overview:
    - Batches assigned to the assessment agencies for conducting the assessment on SDMS/SIP or email
    - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
    - Assessment agency deploys the ToA certified Assessor for executing the assessment
    - SSC monitors the assessment process & records
2. Testing Environment

    To ensure a conducive environment for conducting a test, the trainer will:
    - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
    - Check the duration of the training.
    - Check the Assessment Start and End time to be 10 a.m. and 5 p.m.
    - Ensure there are 2 assessors if the batch size is more than 30.
    - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
    - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
    - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
    - Check the availability of the Lab Equipment for the particular Job Role.
3. Assessment Quality Assurance levels / Framework:
    - Question papers created by the Subject Matter Experts (SME)
    - Question papers created by the SME verified by the other subject Matter Experts
    - Questions are mapped with NOS and PC
    - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
    - The assessor must be ToA certified & trainer must be ToT Certified
    - Assessment agency must follow the assessment guidelines to conduct the assessment
4. Types of evidence or evidence-gathering protocol:
    - Time-stamped & geotagged reporting of the assessor from assessment location
    - Centre photographs with signboards and scheme-specific branding
    - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
    - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos
5. Method of verification or validation:

    To verify the details submitted by the training centre, the assessor will undertake:
    - A surprise visit to the assessment location
    - A random audit of the batch

- A random audit of any candidate

6. Method for assessment documentation, archiving, and access

   To protect the assessment papers and information, the assessor will ensure:

   - Hard copies of the documents are stored
   - Soft copies of the documents & photographs of the assessment are uploaded/ accessed from Cloud Storage
   - Soft copies of the documents & photographs of the assessment are stored in the Hard drive

References

Glossary

Term	Description
Declarative knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood to accomplish a task or to solve a problem.
Key Learning	The key learning outcome is the statement of what a learner needs to know, understand and be able to do to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on the site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on the site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do **upon the completion of the training**.
Terminal Outcome	The terminal outcome is a statement of what a learner will know, understand and be able to do **upon the completion of a module.** A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
ITI	Industrial Training Institute
MCU	Micro-Controller Unit
NCO	National Occupational Standards
NOS	National Skills Qualification Committee
NSQF	National Skills Qualification Framework
OJT	On-the-Job Training
OMR	Optical Mark Recognition
PC	Performance Criteria
PwD	Persons with Disabilities
QP	Qualification Pack
SDMS	Skill Development & Management System
SIP	Skill India Portal
SME	Small and Medium Enterprises
SOP	Standard Operating Procedure
SSC	Sector Skill Council
TC	Trainer Certificate
ToA	Training of Assessors
ToT	Training of Trainers
TP	Training Provider
UL	Underwriter Laboratories
VTP	Vocational Training Provider