



Model Curriculum

QP Name: Field Technician - Air Conditioner

QP Code: ELE/Q3102

QP Version: 3.0

NSQF Level: 4

Model Curriculum Version: 3.0

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

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Training Parameters

Sector	Electronics
Sub-Sector	Consumer Electronics & IT Hardware
Occupation	After Sales Service
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7421.0401
Minimum Educational Qualification and 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	27/01/2022
Next Review Date	27/06/2025
NSQC Approval Date	27/01/2022
QP Version	3.0
Model Curriculum Creation Date	27/01/2022
Model Curriculum Valid Up to Date	27/06/2025
Model Curriculum Version	3.0
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:

- Describe the process of engaging with customer with service.
- Demonstrate the process of performing installation and repair of air conditioner.
- Explain the importance of following inclusive practices for all genders and PwD at work.
- Demonstrate various practices to be followed to maintain health and safety at work.

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 (Recommended)	On-the-Job Training Duration (Mandatory)	Total Duration
Bridge Module	06:00	24:00	00:00	00:00	30:00
Module 1: Introduction and orientation to the role of a Field Technician- Air Conditioner	06:00	24:00	00:00	00:00	30:00
ELE/N3101 Engage with customer for service	60:00	90:00	00:00	75:00	225:00
Module 2: Process of engaging with customer with service	60:00	90:00	00:00	75:00	225:00
ELE/N3108: Perform installation and repair of air conditioner	60:00	90:00	00:00	75:00	225:00
Module 3: Process of performing installation and repair of air conditioner	60:00	90:00	00:00	75:00	225:00

ELE/N9905 Work effectively at the workplace	15:00	15:00	00:00	00:00	30:00
Module 4: Soft Skills and Work Ethics	15:00	15:00	00:00	00:00	30:00
ELE/N1002 Apply health and safety practices at the workplace	15:00	15:00	00:00	00:00	30:00
Module 5: 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 6: Employability Skills (60 Hours)	24:00	36:00	00:00	00:00	60:00
Total Duration	180:00	270:00	00:00	150:00	600:00

Module Details

Module 1: Introduction and orientation to the role of a Field Technician – Air Conditioner

Bridge Module

Terminal Outcomes:

- Discuss the job role of a Field Technician-Air Conditioner.

Duration: 06:00	Duration: 24:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the size and scope of the electronic industry and its sub-sectors. • Discuss the role and responsibilities of a Field Technician-Air Conditioner. • Describe various employment opportunities for a Field Technician-Air Conditioner. 	<ul style="list-style-type: none"> • Familiarization with the Types of Air Conditioner • Overview of working of the Air Conditioner and its components
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
NA	

Module 2: Process of engaging with customer with service

Mapped to ELE/N3101

Terminal Outcomes:

- Describe the process of interacting with customer.
- Explain how to Suggest possible solutions.

Duration: 60:00	Duration: 90:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the company’s policies on code of conduct, organisation's culture, customer care, reporting structure and documentation policy. • Explain the company’s products and recurring problems reported in consumer appliances. • State the precautions to be taken while handling field calls and dealing with customers. • Explain the importance of personal grooming with proper etiquettes at the customer's premises. • Explain the basic electrical, mechanical modules of various appliances and electronics involved in the type of appliance. • List models of different appliances, their common and distinguishing features, functionality of different features of appliances and new features. 	<ul style="list-style-type: none"> • Demonstrate how to connect with the customer to confirm the problem telephonically and fix a time for the visit. • Show how to collect appropriate tools, parts, relevant reference sheets, manuals and documents. • Show how to check about warranty status of the appliance and annual maintenance contract.
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
NA	

Module 3: Process of performing installation and repair of air conditioner

Mapped to ELE/N3108

Terminal Outcomes:

- Demonstrate the process of performing pre-installation checks.
- Demonstrate the process of installing the air conditioner.
- Describe the process of analysing symptoms, identifying and rectifying the faults.
- Describe the process of completing the documentation.

Duration: 60:00	Duration: 90:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the safety rules, policies, procedures and quality standards to be followed. • List the installation-site requirements such as structural requirements, ventilation, etc. • Explain the manual-based procedure of installing the air conditioner. • Explain how to fix various accessories and parts that have accompanied the unit. • Explain how to operate tools such as screw drivers, electric drill for installation. • Explain the packaging waste disposal procedures. • Explain how to operate the air conditioner and use the various features. • Explain the method of air conditioning, its use and functioning of sealed system. • Describe troubleshooting knowledge with respect to air conditioners. • List frequently occurring faults such as poor/no cooling, noisy unit, condensation water over flowing and basic electrical faults such as improper/no earthing, defective power cord, etc. • Explain basic electrical and mechanical modules of the air conditioner. 	<ul style="list-style-type: none"> • Show how to check structural requirements such as distance from power supply, distance from windows/doors being opened frequently. • Demonstrate how to remove the air conditioner packaging without causing any damage. • Demonstrate the process of disposing the packaging material waste as per company's norms. • Demonstrate how to measure the location to drill holes ensuring that no internal wiring damage takes place. • Demonstrate the process of placing the outdoor unit at a suitable location and attaching it firmly to the wall/floor. • Show how to connect the indoor and the outdoor units using the field copper pipe of appropriate size and interconnecting cables. • Show how to fill in additional gas if the distance between the indoor and the outdoor units is more than what is recommended. • Demonstrate the process of carrying out basic tests such as power supply inspection, volt-ampere test, etc. • Show how to repair or replace the faulty part as per requirement at the customer location or send it to the service center on time in case immediate repair is not possible for

<ul style="list-style-type: none"> • Explain the usage of test equipment and tools such as multi-meter, oscilloscope, temperature meter, pressure gauges, etc. • Explain how to detect defects in the compressor, condenser and other problems such as improper alignment of unit, low refrigerant charge, etc along with their reasons. • Explain how to diagnose reasons for improper cooling by diagnosing causes such as dirty filter, blocked coil, bent fins, improper damper setting, low capacity of unit, etc. • Explain the fundamentals of electricity such as ohms law, difference between ac and dc, etc., basic electronic components such as diode, transformer, LED, photo transistor, etc., electrical and electronic symbols, multiples and SI units. • Explain the basics of types of refrigerants such as R12, R22, R134a, R290, R600a, R410, R32. • Explain the use of different brazing sticks, types of brazing torches, types of fluxes and their application. • Explain how to document completion note for customers. • Explain how to record completion information in the ERP system. 	<p>specialized parts such as PCB.</p> <ul style="list-style-type: none"> • Demonstrate how to replace dysfunctional module/part after collecting it from the service center. • Demonstrate the process of carrying out brazing operation at the customer premise or pass the complaint on to a specialist in-charge of handling brazing. • Demonstrate how to reassemble the unit after rectifying an identified fault. • Show how to fill out the customer acknowledgement form.
<p>Classroom Aids</p>	
<p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>Different types of air conditioners such as window and split AC, Testing equipment as multi-meter, clamp meter, vacuum pump, weigh scale, gas cylinder, temperature meter, pressure gauges, Wiring accessories, Tube cutter, Tube bender, Flaring tool, Brazing tool</p>	

Module 4: 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
<ul style="list-style-type: none"> • 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 as data breaches, 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). 	<ul style="list-style-type: none"> • 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.

<ul style="list-style-type: none">• Discuss ways of dealing with heightened emotions of self and others.	
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Sample Of Escalation Matrix, Organization Structure.	

Module 5: 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
<ul style="list-style-type: none"> • Discuss job-site hazards, risks and accidents. • Explain the organizational safety procedures for maintaining electrical safety, handling tools and hazardous materials. • Elaborate on 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 workplace. 	<ul style="list-style-type: none"> • 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.

Classroom Aids

Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop

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 6: 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
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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 7: On-the-Job Training

Mapped to Field Technician- Air Conditioner

Mandatory Duration: 150:00	Recommended Duration: 00:00
Location: On Site	
Terminal Outcomes <ol style="list-style-type: none">1. Collecting the appropriate tools, parts, relevant reference sheets, manuals and documents.2. Explain the company's policies on code of conduct, organisation's culture, customer care, reporting structure and documentation policy.3. Removing the air conditioner packaging without causing any damage.4. Using the tools and fitments required for the installation.5. Mounting the indoor unit.6. Connecting the indoor and the outdoor units using the field copper pipe of appropriate size and interconnecting cables7. Communicating effectively at the workplace.8. Applying health and safety practices at the workplace.	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Diploma/ I.T.I/ Certified in CITS Trade	Electronics/ Mechanical / Electrical	1	Air Conditioner	1 year preferably	Electronics	

Trainer Certification	
Domain Certification	Platform Certification
<p>“Field Technician-Air Conditioner”, “ELE/Q3102, v3.0”, Minimum accepted score is 80%</p>	<p>Recommended that the Trainer is certified for the Field Technician – Air Conditioner “Trainer (VET and Skills)”, mapped to the Qualification Pack: “MEP/Q2601, V2.0”, with minimum score of 80%</p>

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
Diploma/ I.T.I/ Certified in CITS Trade	Electronics/ Mechanical / Electrical	2	Air Conditioner	1 year preferably	Electronics	

Assessor Certification	
Domain Certification	Platform Certification
<p>“Field Technician-Air Conditioner”, “ELE/Q3102, v3.0”, Minimum accepted score is 80%</p>	<p>Recommended that the Assessor is certified for the Field Technician – Air Conditioner “Assessor (VET and Skills)”, mapped to the Qualification Pack: “MEP/Q2701, V2.0”, with minimum score of 80%</p>

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
- The 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. respectively
- 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 and the trainer must be ToT Certified
- The 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 on 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 in order to accomplish a task or to solve a problem.
Key Learning	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order 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 site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on 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	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
ISO	International Organization for Standardization
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