



Model Curriculum

QP Name: Assistant Technician - Air Conditioner

QP Code: ELE/Q3123

QP Version: 1.0

NSQF Level: 3

Model Curriculum Version: 1.0

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	3
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7233.50
Minimum Educational Qualification and Experience	10th Grade Pass OR 8th Grade Pass + NTC (2 years after 8th) OR 8th Grade Pass + 2 years relevant experience and 18 Years
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	15.02.2023
Next Review Date	15.08.2023
NSQC Approval Date	15.02.2023
QP Version	1.0
Model Curriculum Creation Date	15.02.2023
Model Curriculum Valid Up to Date	15.08.2023
Model Curriculum Version	1.0
Maximum Duration of the Course	210 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
ELE/N3108: Perform installation and repair of air conditioner	30:00	90:00	00:00	00:00	120:00
Module 1: Process of performing installation and repair of air conditioner	30:00	90:00	00:00	00:00	120:00
DGT/VSQ/N0103- Employability Skills (90 Hours)	36:00	54:00	00:00	00:00	90:00
Module 2: Employability Skills (90 Hours)	36:00	54:00	00:00	00:00	90:00
Total Duration	66:00	144:00	00:00	00:00	210:00

Module Details

Module 1: 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: 30:00	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. 	<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

<ul style="list-style-type: none"> • Explain basic electrical and mechanical modules of the air conditioner. • 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>customer location or send it to the service center on time in case immediate repair is not possible for 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 2: Employability Skills (90 Hours) Mapped to DGT/VSQ/N0103

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: 36:00	Duration: 54:00
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 3: On-the-Job Training

Mapped to Assistant Technician- Air Conditioner

Mandatory Duration: 00:00	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
“Assistant Technician-Air Conditioner”, “ELE/Q3123,v1.0”, Minimum accepted score is 80%	“Trainer”, “MEP/Q2601” with a minimum score of 80%

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
“Assistant Technician-Air Conditioner”, “ELE/Q3123, v1.0”, Minimum accepted score is 80%	“Assessor”, “MEP/Q2701” with a 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
- 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