



Model Curriculum

QP Name: Field Technician – UPS and Inverter

QP Code: ELE/Q7201

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	Industrial Automation
Occupation	Sales and After Sales Service
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7412.0801
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:

- Elucidate ways to understand customer's requirement.
- Demonstrate the process of installing the UPS/Inverter.
- Demonstrate the process of repairing dysfunctional UPS/ Inverter.
- 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 (Mandatory)	On-the-Job Training Duration (Recommended)	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 – UPS and Inverter	06:00	24:00	00:00	00:00	30:00
ELE/N0061: Understand requirement of customer	40:00	20:00	50:00	00:00	110:00
Module 2: Understand customer's requirement	40:00	20:00	50:00	00:00	110:00
ELE/N7201: Install the UPS/ Inverter	40:00	80:00	50:00	00:00	170:00
Module 3: Process of installing the UPS/Inverter	40:00	80:00	50:00	00:00	170:00
ELE/N7202: Repair dysfunctional UPS/ Inverter	40:00	80:00	50:00	00:00	170:00
Module 4: Process of repairing dysfunctional UPS/ Inverter	40:00	80:00	50:00	00:00	170:00
ELE/N9905 Work effectively at the workplace	15:00	15:00	00:00	00:00	30:00

Module 5: 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 6: 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 7: 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: Introduction and orientation to the role of a Field Technician – UPS and Inverter

Bridge Module

Terminal Outcomes:

- Discuss the job role of a Field Technician- UPS and Inverter.

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 electronics industry and its sub-sectors. • Discuss the role and responsibilities of a Field Technician- UPS and Inverter. • Describe various employment opportunities for a Field Technician- UPS and Inverter. 	<ul style="list-style-type: none"> • Introduction to the components of UPS • Practical on Inverter components
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
NA	

Module 2: Understand customer requirements

Mapped to ELE/N0061

Terminal Outcomes:

- Elucidate ways how to interact with the customer prior to visit.
- Elaborate how to interact with customer at their premises.
- Explain the importance of achieving productivity and quality as per organization's norms.

Duration: 40:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss companys policies on: customer care, warranty. • Discuss companys code of conduct. • Explain organisation culture and typical customer profile. • Explain companys reporting structure. • Discuss companys documentation policy. • Explain companys products and recurring problems reported in consumer appliances. • Explain basic electrical and mechanical modules of various industrial electronic products. • Explain circuit design of the type and model of product. • Explain etiquette to be followed at customers premises. • Explain precautions to be taken while handling field calls and dealing with customers. • Describe relevant reference sheets, manuals and documents to carry in the field. • Explain the importance of maintaining clean surface/work area. • Explain significance of etiquette such as maintaining the appropriate physical distance with customer during conversation, not entering bedroom without permission. 	<ul style="list-style-type: none"> • Role play how to make a call to customer to confirm problem and schedule the time for visit. • Show how to exchange greetings with the customer and confirm the problem registered. • Role play how to interacting with customer. • Prepare a sample optimum route plan to complete daily target visits.
Classroom Aids	

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

Tools, Equipment and Other Requirements

Module 3: Process of installing the UPS/ Inverter

Mapped to ELE/N7201

Terminal Outcomes:

- Demonstrate the process of undertake pre-installation site visit.
- Explain ways to check accessories.
- Describe the process of placing and wiring the UPS/Inverter.
- Elucidate ways to check functioning of the product.
- Explain the importance of completing the documentation.
- Explain the importance of interacting with supervisor/superior.
- Elucidate the importance of achieving productivity and quality as per organization's norms.

Duration: 40:00	Duration: 80:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss companys policies on: incentives, delivery standards, and personnel management, call closure. • Discuss companys sales, installation and after sales support policy. • Explain the importance of the individuals role in the workflow. • Discuss reporting structure. • Discuss companys policy on products warranty and other terms and conditions. • Explain various installation site requirements (structural requirements, ventilation, etc.) • Elucidate different features and functionalities of various models. • Describe the fundamentals of electricity, electrical components and electrical schematic symbols. • Elucidate safety precautions to be taken while installing such as wearing rubber gloves, removing metals objects from the surroundings etc. • Describe manual-based procedure of installing the UPS/inverter. • Describe packaging waste disposal procedures. • Explain the use of test equipment and tools such as multi-meter, 	<ul style="list-style-type: none"> • Demonstrate the process of carrying out pre-installations/masonry/electrical work to be carried out. • Show how to remove watches, rings or any other metal objects before installation procedure. • Demonstrate how to detach all bolts and shipping brackets and separate the UPS cabinet. • Show how to place the UPS at the final location, then connect the power and control wirings through the top or bottom of the cabinet. • Demonstrate the process of reinstalling safety shields removed during the process of installation. • Demonstrate how to align the UPS/inverter as per the instruction manual. • Demonstrate how to document the work completed on the company ERP software for tracking and future references. • Demonstrate the process of using the correct tools and equipment for installation.

<p>oscilloscope.</p> <ul style="list-style-type: none"> • Elucidate safety rules, policies and procedures. • Describe various quality standards to be followed. • Elucidate operations, setting and uses of UPS/inverter and its uses. • List various accessories and parts that have accompanied the unit. • Elucidate features and functionalities after the installation of UPS/inverter. • List various tools for installation like screw drivers. • Describe appropriate settings after plugging in. 	
<p>Classroom Aids</p>	
<p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>	
<p>Tools, Equipment and Other Requirements</p>	

Module 4: Process of repairing dysfunctional UPS/ Inverter

Mapped to ELE/N7202

Terminal Outcomes:

- Explain the importance of understanding the symptoms and identify the fault.
- Describe the process of replacing dysfunctional module in the UPS/inverter unit.
- Explain ways to confirm functionality of the repaired unit.
- Elucidate the importance of achieving productivity and quality as per organization's norms.

Duration: 40:00	Duration: 80:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the functionalities of the UPS/inverter and procedures to make settings. • Explain the functioning of the appliance and its various modules. • Describe UPS communication interface and wiring procedures. • Describe daily, monthly and annual maintenance procedures of the equipment and battery maintenance. • Describe battery recycling procedure. • Explain basic electronics and electronic components (knowledge of components such as diode, transformer, LED, photo transistor, capacitor, resistor, inductor, thermistors). • Discuss fundamentals of electricity such as ohms law. • Explain difference between AC and DC. • Explain ways to calculation of energy consumption of appliances. • Elucidate domestic wiring, series and parallel connections. • Elucidate troubleshooting knowledge with respect to UPS/inverters. • Discuss faults such as blown fuse, dead battery, etc. • List various components/modules of the UPS/inverter and their prices. • Explain the operations of computers 	<ul style="list-style-type: none"> • Demonstrate how to disconnect the power source and open the cabinet doors of the equipment. • Demonstrate how to disconnect the battery and wait for electrolytic capacitor to discharge. • Show how to remove protective panels since the voltage present is potentially lethal. • Demonstrate the process of carry out basic tests such as power supply inspection, volt ampere test and earth test power supply etc. • Demonstrate the process of removing and replacing the faulty module with a functional one. • Demonstrate the process of reassembling the unit and making all power as well as communication wirings.

<p>and software installed.</p> <ul style="list-style-type: none"> • Explain the operations and use of multi-meter, oscilloscope, clamp meter, screw driver. 	
<p>Classroom Aids</p>	
<p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>	
<p>Tools, Equipment and Other Requirements</p>	

Module 5: 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. 	
<p>Classroom Aids</p>	
<p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>Sample Of Escalation Matrix, Organization Structure.</p>	

Module 6: 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 7: 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 8: On-the-Job Training

Mapped to Field Technician – UPS and Inverter

Mandatory Duration: 150:00	Recommended Duration: 00:00
Location: On Site	
<p>Terminal Outcomes</p> <ol style="list-style-type: none"> 1. Explain basic electrical and mechanical modules of various industrial electronic products. 2. Explain various precautions to be taken while handling field calls and dealing with customers. 3. Carry out pre-installations/masonry/electrical work to be carried out. 4. Detach all bolts and shipping brackets and separate the UPS cabinet. 5. Diagnose the fault based on customer interaction and initial inspection. 6. Reassemble the unit and make all power as well as communication wirings. 7. Demonstrate and confirm functionality of the unit with customer. 8. Perform tasks as per workplace standards, organisational policies and legislative requirements. 9. Dispose electronic waste (such as toxins; metals such as lead, cadmium, barium; flame retardant plastics, welding slag etc.) as per industry approved techniques. 10. Administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock. 	

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	1	UPS and Inverter	1 year preferably	Electronics	

Trainer Certification	
Domain Certification	Platform Certification
<p>“Field Technician – UPS and Inverter”, “ELE/Q7201, v3.0”, Minimum accepted score is 80%</p>	<p>Recommended that the Trainer is certified for the Field Technician – UPS & Inverter “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/ ITI/ Certified in relevant CITS course	Electronics/ Electrical/ Mechanical	2	UPS and Inverter	1 year preferably	Electronics	

Assessor Certification	
Domain Certification	Platform Certification
<p>“Field Technician – UPS and Inverter”, “ELE/Q7201, v3.0”, Minimum accepted score is 80%</p>	<p>Recommended that the Assessor is certified for the Field Technician – UPS & Inverter “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