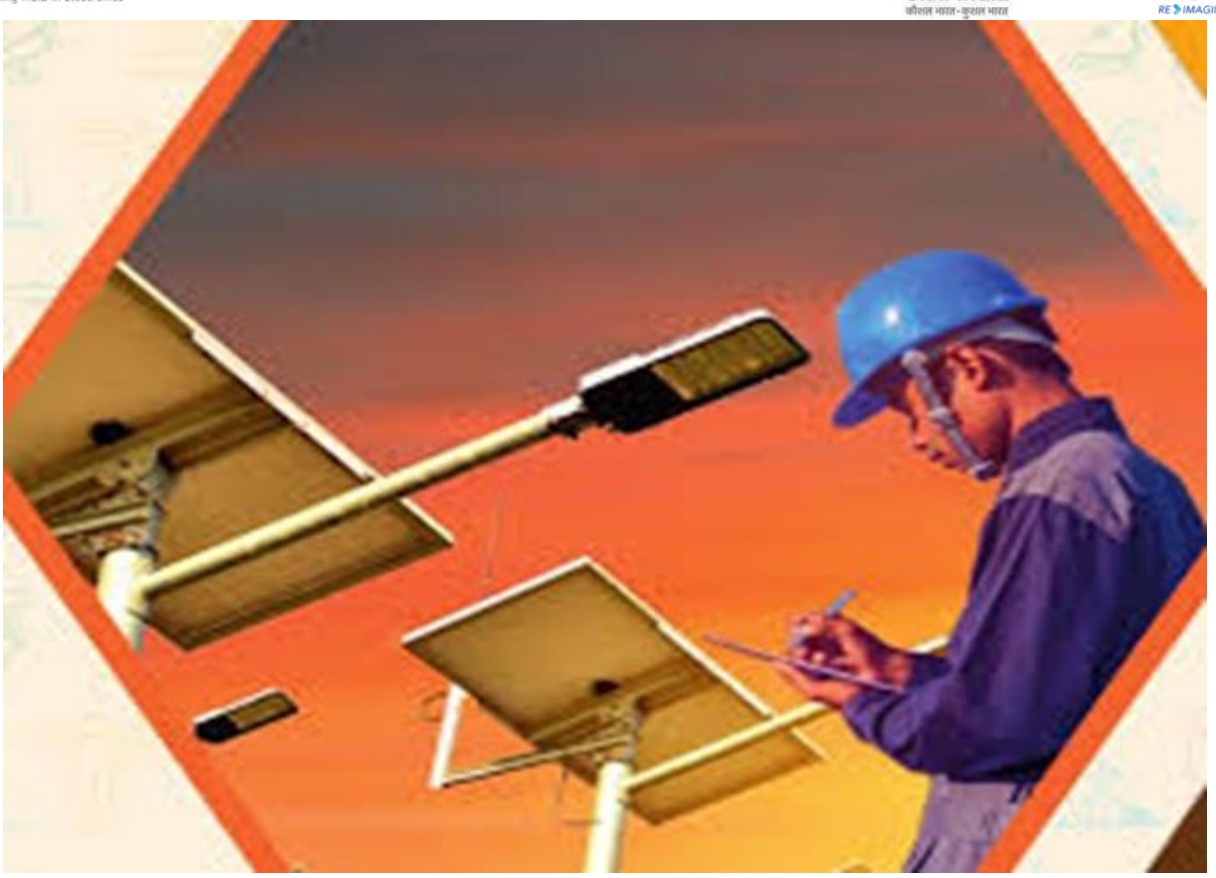

Model Curriculum

QP Name: Solar LED Technician

QP Code: ELE/Q5903

QP Version: 4.0

NSQF Level: 4

Model Curriculum Version: 4.0

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	Solar & LED
Occupation	Installation-S&L
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7421.1401
Minimum Educational Qualification and Experience	12th grade Pass (or equivalent in science) with NA of experience OR 10th grade pass with 3 Years of Relevant Experience OR Certificate-NSQF (Level 3.5) with 1.5 years of Relevant experience # Relevant Experience in Solar & LED industries.
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	08.05.2025
Next Review Date	08.05.2028
NSQC Approval Date	08.05.2025
QP Version	4.0
Model Curriculum Creation Date	08.05.2025
Model Curriculum Valid Up to Date	08.05.2028
Model Curriculum Version	4.0
Minimum Duration of the Course	450 Hours
Maximum Duration of the Course	450 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.

- Install & repair solar based LED -home lighting system and Street Lighting system.
- Prepare structures for panel installation.
- Fix PV panels on a roof and non-roof structure.
- Perform routine maintenance and repair.
- Identify and repair faults.
- Interact and coordinate with the supervisor and colleagues etc.
- Follow safe and healthy work practices.

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
ELE/N5911: Carry out the installation of the Solar PV System	**60:00**	**90:00**	**60:00**	**00:00**	**210:00**
Module 1: Perform installation of Solar PV System	60:00	90:00	60:00	00:00	210:00
ELE/N5912: Carry out maintenance and repairs on the Solar PV System	**60:00**	**90:00**	**60:00**	**00:00**	**210:00**
Module 2: Perform maintenance and repair of Solar PV System	60:00	90:00	60:00	00:00	210:00
DGT/VSQ/N0101- Employability Skills (30 Hours)	**30:00**	**00:00**	**00:00**	**00:00**	**30:00**
Module 3: Employability Skills (30 Hours)	30:00	00:00	00:00	00:00	30:00
Total Duration	**150:00**	**180:00**	**120:00**	**00:00**	**450:00**

Module Details

Module 1: Perform installation of Solar PV System

Mapped to ELE/N5911

Terminal Outcomes:

- Perform steps for solar panel installation.

Duration: *60:00*	**Duration**: *90:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe renewable energy resources. • Discuss need of solar power and its application • Describe solar power generation system. • Describe fundamental of Solar PV Cells. • List parameters of Solar PV Panels. • Describe effect of environment in generation of electricity through solar PV modules • List components of Solar PV systems and their use. • Describe basics of LED & its parameters. • Describe CCT & CRI. • Discuss importance of Thermal Management in LED lighting products. • Elaborate Optical Management of LED Luminary. • Describe LED Driver. • Discuss necessity of earthling systems arrangements and requirements. • Describe methods and tools used to fix the solar led light system • List various types of Building materials used in roof structures, ground structures, interior and exterior of customer's premises.	• Demonstrate use of different types of Solar PV Panels. • Demonstrate use and handling procedure of Solar PV Panels. • Apply appropriate ways to check output of Solar Panels on different angles. • Demonstrate how to prepare the work area for installation of solar led light. • Demonstrate procedure of fixing the solar led light system. • Show how to select the appropriate type of mounting system and conditions suitable for the required LED Lighting • Show how to terminate the wiring correctly in line with manufacturer's instructions, operational and regulatory requirements. • Show how to fix Solar LED Lightings with safely. • Demonstrate post installation activities like:- leave the work area in clean and safe condition, handover the complete work to the customer as per company policies, etc.
Classroom Aids:	
Whiteboard, marker pen, computer or laptop attached to LCD projector, scanner, computer speakers	
Tools, Equipment and Other Requirements	
Solar PV Panels, Batteries, Charge Controllers, Inverter, AC/DC Load, Wire Stripper, LED Products, LED Drivers, DC Power Supply, Thermal Pad, Thermal Greece, Connecting Wires, Mounting Structure, LED Lights, Drill Machine, Compass, Batteries, Digital Multi-meter, Screw Driver Set, Pliers, Wire Cutter, job sheets, report formats.	

Module 2: Perform maintenance and repair of Solar PV System

Mapped to ELE/N5912

Terminal Outcomes:

- Demonstrate maintenance and repair of Solar PV System.

Duration: *60:00*	**Duration**: *90:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe health and safety legislation, regulations and other relevant guidelines. • Discuss need of obtaining appropriate work order from responsible authority. • List resources and materials required during work. • List the steps to be performed for troubleshooting and repairing of solar panel system. • Discuss various problems and their remedies generally occur in solar PV panels.	• Show how to introduce self and organization correctly, and state the purpose of your visit to the customer. • Show how to obtain appropriate work order from responsible authority and confirm the type of system fault from the job specifications given. • Show how to identify and obtain resources and materials needed for the type of work in accordance with organizational standards and procedures • Show how to remove and replace faulty components using approved methods without causing damage. • Demonstrate organisational procedure of reporting any unprecedented problems identified in the work to responsible authority and seek advice on how to resolve them.
Classroom Aids:	
Whiteboard, marker pen, computer or laptop attached to LCD projector, scanner, computer speakers	
Tools, Equipment and Other Requirements	
Solar PV Panels, Batteries, Charge Controllers, Inverter, AC/DC Load, Wire Stripper, LED Products, LED Drivers, DC Power Supply, Thermal Pad, Thermal Greece, Connecting Wires, Mounting Structure, LED Lights, Drill Machine, Compass, Batteries, Digital Multi-meter, Screw Driver Set, Pliers, Wire Cutter, job sheets, report formats.	

Module 3: Employability Skills (30 Hours)
Mapped to DGT/VSQ/N0101

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: 30:00	Duration: 00:00
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.	
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 4: On-the-Job Training

Mapped to Solar LED Technician

Mandatory Duration: *120:00*	**Recommended Duration**: *00:00*
Location: On Site	

Terminal Outcomes

1. Explain the fundamental concepts of electronics and electronics components
2. Read the drawing, component symbols and work orders for identifying work requirements, selecting and planning sequence of installation
3. Arrange tools, measuring instruments and equipment from the store
4. Install solar panels at appropriate area
5. Perform maintenance and repair of Solar PV System
6. Repair or replace faulty components of solar panel system
7. Perform post-installation activities like cleaning, functionality check etc.
8. Interact and coordinate with supervisor and colleagues
9. Work as per the given timeline and quality standards
10. Maintain a safe, healthy and secure work environment

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 Trade	Electronics /Electrical/ Mechanical	2	Solar and LED installation and repairing	1	Trainer	

Trainer Certification	
Domain Certification	**Platform Certification**
"**Solar LED Technician**, ELE/Q5903, version 4.0". Minimum accepted score is 80%.	Recommended that the Trainer is certified for the **Solar LED Technician** "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 Trade	Electronics/ Electrical/ Mechanical	3	Solar and LED installation and repairing installation	2	Assessor	

Assessor Certification	
Domain Certification	**Platform Certification**
"**Solar LED Technician**, ELE/Q5903, version 4.0". Minimum accepted score is 80%.	Recommended that the Assessor is certified for the **Solar LED Technician** "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:
    - 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 as 10 a.m. and 5 p.m.
    - If the batch size is more than 30, then there should be 2 Assessors.
    - 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
    - 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:
    - Surprise visit to the assessment location

- Random audit of the batch
- Random audit of any candidate

6. Method for assessment documentation, archiving, and access
    - 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 Drives

References

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.

Acronyms and Abbreviations

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
IPR	Intellectual Property Rights