



# Model Curriculum

**QP Name: Electrical Technician**

**QP Code: ELE/Q6301**

**QP Version: 3.0**

**NSQF Level: 3**

**Model Curriculum Version: 3.0**

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

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# Training Parameters

|   |  |
|---|--|
| <b>Sector</b>   | Electronics  |
| <b>Sub-Sector</b>                                       | Industrial Automation  |
| <b>Occupation</b>                                       | Assembly and Integration   |
| <b>Country</b>  | India  |
| <b>NSQF Level</b>                                       | 3  |
| <b>Aligned to NCO/ISCO/ISIC Code</b>                    | NCO-2015/8212.2401   |
| <b>Minimum Educational Qualification and Experience</b> | 10th Grade Pass<br>OR<br>8th Grade Pass + NTC (2 years after 8th)<br>OR<br>8th Grade Pass + 2 years relevant experience<br>and<br>18 Years |
| <b>Pre-Requisite License or Training</b>                | NA   |
| <b>Minimum Job Entry Age</b>                            | 18 Years   |
| <b>Last Reviewed On</b>                                 | 27/01/2022   |
| <b>Next Review Date</b>                                 | 27/06/2025   |
| <b>NSQC Approval Date</b>                               | 27/01/2022   |
| <b>QP Version</b>                                       | 3.0  |
| <b>Model Curriculum Creation Date</b>                   | 27/01/2022   |
| <b>Model Curriculum Valid Up to Date</b>                | 27/06/2025   |
| <b>Model Curriculum Version</b>                         | 3.0  |
| <b>Maximum Duration of the Course</b>                   | 420 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:

- Demonstrate the process of integrating electrical sub systems.
- Describe the process of communicating and coordinating effectively with others.
- Explain the importance of work Ethics, sustainability and safety practice.

### 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 |
|--|-----------------|--------------------|--|--|----------------|
| <b>Bridge Module</b>   | <b>20:00</b>    | <b>10:00</b>       | <b>00:00</b>                               | <b>00:00</b>                             | <b>30:00</b>   |
| Module 1: Introduction and orientation to the role of an Electrical Technician | 20:00           | 10:00              | 00:00                                      | 00:00                                    | 30:00          |
| <b>ELE/N6301: Integrate electrical sub system</b>                              | <b>40:00</b>    | <b>110:00</b>      | <b>00:00</b>                               | <b>150:00</b>                            | <b>300:00</b>  |
| Module 2: Effective interaction with customers                                 | 40:00           | 110:00             | 00:00                                      | 150:00                                   | 300:00         |
| <b>ELE/N9972: Communicate and coordinate effectively</b>                       | <b>15:00</b>    | <b>15:00</b>       | <b>00:00</b>                               | <b>00:00</b>                             | <b>30:00</b>   |
| Module 3: Process of communicating and coordinating effectively with others    | 15:00           | 15:00              | 00:00                                      | 00:00                                    | 30:00          |
| <b>ELE/N1003: Work effectively, sustainably and safely</b>                     | <b>15:00</b>    | <b>15:00</b>       | <b>00:00</b>                               | <b>00:00</b>                             | <b>30:00</b>   |
| Module 4: Work Ethics, sustainability and safety practice                      | 15:00           | 15:00              | 00:00                                      | 00:00                                    | 30:00          |

|   |               |               |              |               |               |
|---|---------------|---------------|--------------|---------------|---------------|
| <b>DGT/VSQ/N0101-<br/>Employability Skills (30<br/>Hours)</b> | <b>30:00</b>  | <b>00:00</b>  | <b>00:00</b> | <b>00:00</b>  | <b>30:00</b>  |
| Module 5: Employability<br>Skills (30 Hours)                  | 30:00         | 00:00         | 00:00        | 00:00         | 30:00         |
| <b>Total Duration</b>   | <b>120:00</b> | <b>150:00</b> | <b>00:00</b> | <b>150:00</b> | <b>420:00</b> |

# Module Details

## Module 1: Introduction and orientation to the role of an Electrical Technician

### Bridge Module

#### Terminal Outcomes:

- Discuss the job role of an Electrical Technician.

| <b>Duration: 20:00</b>  | <b>Duration: 10:00</b>  |
|---|---|
| <b>Theory – Key Learning Outcomes</b>   | <b>Practical – Key Learning Outcomes</b>  |
| <ul style="list-style-type: none"> <li>• Describe the size and scope of the electronics industry and its sub-sectors.</li> <li>• Discuss the role and responsibilities of an Electrical Technician.</li> <li>• Describe various employment opportunities for an Electrical Technician.</li> </ul> | <ul style="list-style-type: none"> <li>• Overview of electrical sub-system</li> <li>• Identification of faulty equipment</li> </ul> |
| <b>Classroom Aids</b>   |   |
| Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop  |   |
| <b>Tools, Equipment and Other Requirements</b>  |   |
| NA  |   |

## Module 2: Process of integrating electrical sub system

### Mapped to ELE/N6301

#### Terminal Outcomes:

- Explain the need of understanding work requirements from the supervisor.
- Demonstrate the process of assembling electrical and electronic sub system.
- Describe the process of reporting problems to supervisor.
- Explain the importance of achieving productivity, quality and safety standards as per company's policy.

| <b>Duration: 40:00</b>  | <b>Duration: 110:00</b>   |
|---|---|
| <b>Theory – Key Learning Outcomes</b>   | <b>Practical – Key Learning Outcomes</b>  |
| <ul style="list-style-type: none"> <li>• Explain company's policies on: incentives, personnel management.</li> <li>• Explain company's code of conduct.</li> <li>• Explain the importance of individuals role in the work flow.</li> <li>• Explain company's reporting structure and documentation policy.</li> <li>• List various electro-mechanical assembly instructions.</li> <li>• Explain general principles of wiring and assembly.</li> <li>• Explain circuit design, block diagram of the product being assembled and functioning of its different modules.</li> <li>• Explain the fundamentals of electricity such as Ohms law, difference between Ac and DC, series and parallel connections.</li> <li>• Explain the basic electronics of components such as diode, transformer, LED, photo transistor, capacitor, resistor, inductor, thermistor, ICs.</li> <li>• Explain how to read values of resistors, capacitors, diodes and integrated circuits with specific reference to colour coding, polarity, orientation, tolerance.</li> <li>• List specific safety precautions while working in an electronic assembly unit.</li> <li>• Explain the maintenance</li> </ul> | <ul style="list-style-type: none"> <li>• Demonstrate the process of assembling the electrical sub system as per the standard operating procedure.</li> <li>• Demonstrate how to report defective or inadequate number of components.</li> <li>• Demonstrate how to report about inadequate quantity of consumables such as wires, connectors, screws, nuts, etc.</li> <li>• Demonstrate how to report any problems in the assembly line in time.</li> <li>• Prepare sample records related to defects/inadequacies identified during the assembly process.</li> </ul> |

|   |  |
|---|--|
| <p>requirement of various tools used during the assembly process.</p> <ul style="list-style-type: none"> <li>• State various frequently occurring errors in the assembly process, causes and preventive measure.</li> <li>• Explain how to communicate with PCB assembly operators in order to meet production deadlines.</li> <li>• Describe various documents and procedures used in the during the assembly process.</li> <li>• Describe the handling procedures of different electrical and mechanical products.</li> </ul> |  |
| <p><b>Classroom Aids</b></p>  |  |
| <p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>   |  |
| <p><b>Tools, Equipment and Other Requirements</b></p>   |  |
| <p>Electrical sub system of the final products with remote, Screw Drivers, Spanners, Drill Machine, Multi-meter, Circuit Tester, Scissors, Pliers, Pencil, Electrical tape, piano wire, Wall Mount Kit, Antenna, STB, Measuring Tape, Hammer, Crimping Tools, Cutter/ knife, Digital IC tester with manual/Batch, CRO Soldering Tool Kit, SMD Soldering Tools, Manual Guide, Trainer Kit</p>  |  |



## Module 3: Process of communicating and coordinating effectively with others

### Mapped to ELE/N9972

#### Terminal Outcomes:

- Explain the importance of communicate effectively with supervisor and colleagues.
- 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"> <li>• Explain the importance of personal grooming.</li> <li>• Explain the organisation's policy on code of conduct.</li> <li>• Explain the organisation's reporting structure and documentation policy.</li> <li>• Explain how to communicate effectively through all means including face-to-face, telephonic as well as written.</li> <li>• Explain different types of information that colleagues might need and the importance of providing the same as and when required.</li> <li>• Explain the rights and duties w.r.t PwD at workplace.</li> <li>• Explain the organisation policies and standards to support PwD.</li> </ul> | <ul style="list-style-type: none"> <li>• Show how to maintain personal hygiene and professional appearance.</li> <li>• Show how to report work completed as per the schedule to superior and inform of any deviations or anomalies.</li> </ul> |
| <b>Classroom Aids</b>  |  |
| Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop   |  |
| <b>Tools, Equipment and Other Requirements</b>   |  |
| NA   |  |

## Module 4: Work Ethics, sustainability and safety practice

### Mapped to ELE/N1003

#### Terminal Outcomes:

- Describe the process of achieving optimum productivity and quality.
- Explain the importance of implementing health and safety procedures.
- Demonstrate the process of organising waste management and recycling.
- Explain the importance of conserving resources.

| <b>Duration: 15:00</b>  | <b>Duration: 15:00</b>  |
|---|---|
| <b>Theory – Key Learning Outcomes</b>   | <b>Practical – Key Learning Outcomes</b>  |
| <ul style="list-style-type: none"> <li>• Explain the importance of time management.</li> <li>• Explain the organizational safety and health policy.</li> <li>• List different waste categories such as dry, wet, recyclable, non-recyclable and single-use plastic items.</li> <li>• Explain the usage of different colours of dustbins to dispose waste.</li> <li>• Explain the methods of waste disposal.</li> <li>• Explain the methods of recycling as well as repairing and reusing electronic components.</li> <li>• Explain the efficient utilisation of material and water.</li> <li>• Explain the basics of electricity and prevalent energy-efficient devices.</li> <li>• List ways to recognise common electrical problems.</li> <li>• List common practices of conserving electricity.</li> </ul> | <ul style="list-style-type: none"> <li>• Show how to take ESD precautions while doing work.</li> <li>• Demonstrate the use of appropriate Personal Protective Equipment (PPE).</li> <li>• Show how to identify and segregate recyclable/non-recyclable and hazardous wastes.</li> <li>• Demonstrate the process of cleaning the tools, machines and equipment.</li> <li>• Show how to connect electrical equipment and appliances properly when in use and turn off when not in use.</li> </ul> |
| <b>Classroom Aids</b>   |   |
| Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop  |   |
| <b>Tools, Equipment and Other Requirements</b>  |   |
| NA  |   |

## Module 5: 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.

| <b>Duration: 30:00</b>  | <b>Duration: 00:00</b>                   |
|---|--|
| <b>Theory – Key Learning Outcomes</b>   | <b>Practical – Key Learning Outcomes</b> |
| <ul style="list-style-type: none"> <li>• Explain constitutional values, civic rights, responsibility towards society to become a responsible citizen</li> <li>• Discuss 21<sup>st</sup> century skills</li> <li>• Explain use of basic English phrases and sentences.</li> <li>• Demonstrate how to communicate in a well-behaved manner</li> <li>• Demonstrate how to work with others</li> <li>• Demonstrate how to operate digital devices</li> <li>• Discuss the significance of Internet and Computer/ Laptops</li> <li>• Discuss the need for identifying business opportunities</li> <li>• Discuss about types of customers.</li> <li>• Discuss on creation of biodata</li> <li>• Discuss about apprenticeship and opportunities related to it.</li> </ul> |  |
| <b>Classroom Aids</b>   |  |
| Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop  |  |
| <b>Tools, Equipment and Other Requirements</b>  |  |
| Computer, UPS, Scanner, Computer Tables, LCD Projector, Computer Chairs, White Board<br>OR<br>Computer Lab  |  |

## Module 6: On-the-Job Training

### Mapped to Electrical Technician

|  |                                    |
|--|------------------------------------|
| <b>Mandatory Duration: 150:00</b>  | <b>Recommended Duration: 00:00</b> |
| <b>Location: On Site</b>   |                                    |
| <b>Terminal Outcomes</b> <ol style="list-style-type: none"><li>1. Explain general principles of wiring and assembly.</li><li>2. Explain the fundamentals of electricity such as Ohms law, difference between Ac and DC, series and parallel connections.</li><li>3. Assemble the electrical sub system as per the standard operating procedure.</li><li>4. Report any problems in the assembly line in time.</li><li>5. Maintain personal hygiene and professional appearance.</li><li>6. Use appropriate Personal Protective Equipment (PPE).</li><li>7. Connect electrical equipment and appliances properly when in use and turn off when not in use.</li></ol> |                                    |

# Annexure

## Trainer Requirements

| Trainer Prerequisites                 |                                     |                              |                            |                     |                |         |
|---------------------------------------|-------------------------------------|------------------------------|----------------------------|---------------------|----------------|---------|
| Minimum Educational Qualification     | Specialization                      | Relevant Industry Experience |                            | Training Experience |                | Remarks |
|                                       |                                     | Years                        | Specialization             | Years               | Specialization |         |
| Diploma/ ITI/ Certified in CITS Trade | Electrical/ Electronics/ Mechanical | 1                            | Assembling and Integration | 1                   | Electronics    |         |

| Trainer Certification   |   |
|---|---|
| Domain Certification  | Platform Certification  |
| <p><b>“Electrical Technician”, “ELE/Q6301, v3.0”,</b><br/>Minimum accepted score is 80%</p> | <p>Recommended that the Trainer is certified for the <b>Electrical Technician</b> “Trainer (VET and Skills)”, mapped to the Qualification Pack: <b>“MEP/Q2601, V2.0”</b>, 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 CITS Trade | Electrical/ Electronics/ Mechanical | 2                            | Assembling and Integration | 1                              | Electronics    |         |

| Assessor Certification   |  |
|--|--|
| Domain Certification   | Platform Certification   |
| <p>“Electrical Technician”, “ELE/Q6301, v3.0”,<br/>Minimum accepted score is 80%</p> | <p>Recommended that the Assessor is certified for the <b>Electrical Technician</b> “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   |
|------------------------------|---|
| <b>Declarative knowledge</b> | 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.   |
| <b>Key Learning</b>          | 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). |
| <b>OJT (M)</b>               | On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site  |
| <b>OJT (R)</b>               | On-the-job training (Recommended); trainees are recommended the specified hours of training on site   |
| <b>Procedural Knowledge</b>  | Procedural knowledge addresses how to do something, or how to perform a   |
| <b>Training Outcome</b>      | Training outcome is a statement of what a learner will know, understand and be able to do <b>upon the completion of the training.</b>   |
| <b>Terminal Outcome</b>      | Terminal outcome is a statement of what a learner will know, understand and be able to do <b>upon the completion of a module.</b> 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                              |