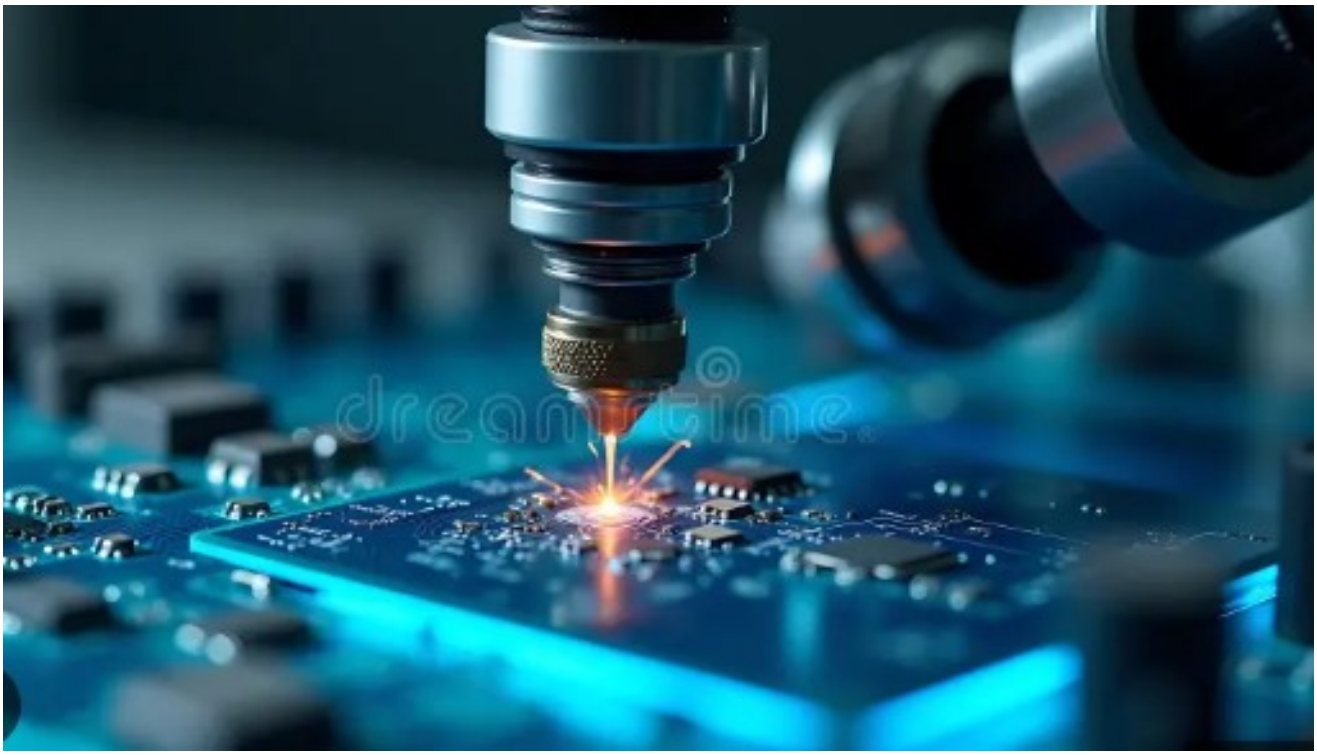

Model Curriculum

QP Name: Assistant Welding Operator (Electronics)

QP Code: ELE/Q0102

QP Version: 5.0

NSQF Level: 3

Model Curriculum Version: 5.0

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	Semiconductor & Components
Occupation	Production- S&C
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3122.4702
Minimum Educational Qualification and Experience	Grade 10th or equivalent or Grade 8th with 3 year relevant experience or Previous NSQF Level 2.5 with 1.5 years of relevant experience # Relevant experience in Semiconductor & Components
Pre-Requisite License or Training	NA
Minimum Job Entry Age	NA
Last Reviewed On	07/10/2025
Next Review Date	07/10/2028
NSQC Approval Date	07/10/2025
QP Version	5.0
Model Curriculum Creation Date	07/10/2025
Model Curriculum Valid Up to Date	07/10/2028
Model Curriculum Version	5.0
Minimum Duration of the Course	420 Hours
Maximum Duration of the Course	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:

- Describe the process of welding the copper lead wire to resistor.
- 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/N0171: Welding Preparation and Setup	**45:00**	**60:00**	**00:00**	**60:00**	**165:00**
Module 1: Welding Operator Electronics – Roles, Preparation, and Setup	45:00	60:00	00:00	60:00	165:00
ELE/N0170: Welding Execution and Quality Control	**45:00**	**90:00**	**00:00**	**90:00**	**225:00**
Module 2: Welding Execution and Quality Control	45:00	90:00	00:00	90:00	225:00
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	**120:00**	**150:00**	**00:00**	**150:00**	**420:00**

Module Details

Module 1: Welding Operator Electronics – Roles, Preparation, and Setup

Mapped to ELE/N0170

Terminal Outcomes:

- Understand basic welding methods, equipment, parameters, and material preparation used in electronics welding.
- Learn safety practices, ESD precautions, and quality standards related to welding setup and operations.

Duration: 45:00	Duration: 60:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the role and responsibilities of a Welding Operator – Electronics; explain the scope of welding in the electronics industry and identify common welding types such as TIG, MIG, spot welding, and micro-welding used for assembling enclosures, frames, and electronic components. Understand the basic principles and applications of welding in electronics manufacturing. • Identify different types of welding techniques used, such as resistance spot welding and ultrasonic welding. • Recognize various welding equipment, tools, and their functions in the setup process. • Explain the preparation of materials and components before welding, including cleaning and alignment. • Understand the significance of welding parameters like current, pressure, time, and their effect on weld quality. • Follow ESD precautions, personal protective equipment (PPE) usage, and safety measures during welding setup. • Interpret welding process documents such as work instructions, drawings, and quality standards.	• Identify and arrange appropriate welding tools, equipment, and fixtures for the required operation. • Prepare electronic components and materials by cleaning, positioning, and aligning them as per the job sheet. • Set welding parameters (current, pressure, time) on the machine according to material and process requirements. • Perform trial welds to check alignment, strength, and quality before actual production. • Follow ESD precautions and wear appropriate PPE while handling welding equipment. • Inspect pre-weld setups to ensure they meet specified standards and rectify any issues. • Maintain records of setup parameters, equipment condition, and pre-process checks as per SOPs.

Classroom Aids
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop
Tools, Equipment and Other Requirements
Different Types of Joints, Resistors, Diodes, Capacitors, Integrated Circuits, Signal Generators, Cathode Ray Oscilloscope (CRO), Multi-meters, LED, Batteries covered Electrode, TIG Welding rod, GMAW Solid Wire, GMAW flux cored wire, SAW wire, Strip Electrodes, Power Source, Electrode Holder and cables, Welder Protection, Fume Extraction, Welding Arc, Plasma, SMAW, welding electrodes, TIG Welding Machine, Torch with Nozzle, Work Clamp, Tungsten, Grinding Wheel, MIG Welder, AC or DC Sources Of Power Angle Grinders, Plasma Cutters, Drills, Flux, Filler Material, Thermoplastics/Metals, Chipping Hammer, Wire Brush, Hand File, Vice Grips, Pliers, Clamps, Adjustable Wrench, Micro- Computer, Welding Machine, Height Gauge, Co2 gas cylinder + Regulator + Gas Heater and Flow Meter, Argon Gas Cylinder, Hydraulic and Lubricating Oil, Consumables Like Electrodes Gas Cylinder and Similar Item, Defective and Good Samples of Weld, Calliper, Micrometre, Asbestos Gloves, Flame-Proof Aprons, Safety Helmets, Trousers, Safety Shoes, Protective Goggles, Safety Mask, Respirator

Module 2: Welding Execution and Quality Control
Mapped to ELE/N0170

Terminal Outcomes:

- Perform welding operations on electronic components as per specified parameters and techniques.
- Inspect weld quality, identify defects, and ensure compliance with safety and quality standards.

Duration: 45:00	Duration: 90:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Understand standard welding techniques used in electronics manufacturing and their applications. • Explain welding parameters and their influence on joint quality (e.g., current, time, pressure). • Identify common welding defects such as cracks, weak joints, and misalignment. • Understand inspection methods and quality control checks for welded electronic components. • Describe documentation procedures for recording weld quality and process deviations. • Explain the importance of adhering to quality standards (e.g., IPC-A-610) and workplace safety during welding execution. • Understand corrective actions and troubleshooting approaches for quality-related welding issues.	• Perform welding on electronic components using appropriate tools and techniques as per job specifications. • Adjust and apply correct welding parameters (e.g., time, pressure, current) to ensure joint quality. • Inspect welded joints visually and using basic testing methods to identify defects. • Rework or repair defective welds following defined procedures. • Record inspection results, defect observations, and corrective actions in quality logs. • Follow ESD safety, PPE usage, and clean work practices throughout the welding process. • Coordinate with quality control personnel for validation and approval of welded assemblies.
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Different Types of Joints, Resistors, Diodes, Capacitors, Integrated Circuits, Signal Generators, Cathode Ray Oscilloscope (CRO), Multi-meters, LED, Batteries covered Electrode, TIG Welding rod, GMAW Solid Wire, GMAW flux cored wire, SAW wire, Strip Electrodes, Power Source, Electrode Holder and cables, Welder Protection, Fume Extraction, Welding Arc, Plasma, SMAW, welding electrodes, Asbestos Gloves, Flame-Proof Aprons, Safety Helmets, Trousers, Safety Shoes, Protective Goggles, Safety Mask, Respirator	

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 Welding Operator Electronics

Mandatory Duration: 150:00	Recommended Duration: 00:00
Location: On Site	

Terminal Outcomes

1. Identifying the various welding parameters such as temperature, pressure, electrode type, electrode distance or gap, welding current, voltage, process time etc. before starting the welding process.
2. Setting the welding machine, apparatus and accessories appropriately.
3. Installing and aligning the work pieces on the welding apparatus appropriately
4. Setting or adjusting the welding parameters.
5. Adjusting welding heads and tooling.
6. Operating the welding machine as specified in work order and sop to weld the electro tinned copper lead wire to the centre of steel and cap.
7. Monitoring the welding process and machine constantly.
8. Performing regular cleaning of machine, equipment and work area.
9. Maintaining the records and documents related to the outcome of weld performed.
10. Communicating effectively at the workplace.
11. 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 relevant CITS Trade	Electronics/ Mechanical / Electrical	1	Welding Operations - Electronics	1 year preferably	Electronics	

Trainer Certification	
Domain Certification	**Platform Certification**
"**Welding Operator Electronics**", "ELE/Q0102, v5.0", Minimum accepted score is 80%	Recommended that the Trainer is certified for the **Welding Operator - Electronics** "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/ I.T.I/ Certified in relevant CITS Trade	Electronics/ Mechanical / Electrical	2	Welding Operations - Electronics	1 year preferably	Electronics	

Assessor Certification	
Domain Certification	**Platform Certification**
"**Welding Operator Electronics**", "ELE/Q0102, v5.0", Minimum accepted score is 80%	Recommended that the Assessor is certified for the **Welding Operator - Electronics** "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
    - 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