Model Curriculum

QP Name: Mechanical Fitter (Electronics)

QP Code: ELE/Q6302

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

Table of Contents

Training Parameters

Sector	Electronics
Sub-Sector	Industrial Automation
Occupation	Assembly and Integration
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7412.0202
Minimum Educational Qualification and Experience	12th grade or equivalent OR 10th grade or equivalent with 3 years relevant experience OR Certificate-NSQF (Level-3 in relevant domain) with 3 Years of relevant Experience # Relevant Experience in Industrial Automation
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	4.0
Model Curriculum Creation Date	07/10/2025
Model Curriculum Valid Up to Date	07/10/2028
Model Curriculum Version	4.0
Minimum Duration of the Course	510 Hours
Maximum Duration of the Course	510 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 mechanical sub system.
- 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/N7309: Mechanical and Electrical Sub-System Preparation	**75:00**	**90:00**	**00:00**	**75:00**	**240:00**
Module 1: Role of Mechanical Fitter Electronics, including preparation of mechanical and electrical sub-systems	75:00	90:00	00:00	75:00	240:00
ELE/N7310: Integration, Quality Control, and Productivity Standards	**75:00**	**90:00**	**00:00**	**75:00**	**240:00**
Module 2: Integration, Quality Control, and Productivity Standards	90:00	90:00	00:00	75:00	240:00
DGT/VSQ/N0101 – Employability Skills (30 Hours)	**30:00**	**00:00**	**00:00**	**00:00**	**30:00**
Module 3: Employability Skills (60 Hours)	30:00	00:00	00:00	00:00	30:00
Total Duration	**180:00**	**180:00**	**00:00**	**150:00**	**510:00**

Module Details

Module 1: Role of Mechanical Fitter Electronics, including preparation of mechanical and electrical sub-systems

Mapped to ELE/N7309

Terminal Outcomes:

- Explain the importance of understanding requirement from the supervisor.
- Demonstrate the process of assembling the mechanical sub system and integrating with electrical sub system.
- Describe the process of reporting problems to supervisor.
- Explain the importance of achieving productivity, quality, and safety standards.

Duration: 75:00	Duration: 90:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the role and responsibilities of a Mechanical Fitter – Electronics; explain the scope of mechanical fitting in the electronics industry, including assembly, alignment, and installation of electro-mechanical components, and identify key employment areas such as electronics manufacturing, automation systems, and service maintenance. • Understand the purpose and function of mechanical and electrical sub-systems within a complete system (e.g., solar PV, HVAC, machinery). • Identify key components of mechanical sub-systems (e.g., mounting structures, frames, enclosures). • Describe key components of electrical sub-systems (e.g., conduits, circuit breakers, inverters, cabling, junction boxes). • Follow standard assembly procedures by using the CAD-based digital blueprints, ERP-driven inventory systems, and AR-guided setups to ensure accurate preparation of tools, fixtures, and components. • Interpret technical drawings, wiring diagrams, and layout plans for mechanical and electrical system installation. • Explain basic principles of load calculation, wire sizing, and voltage drop in electrical sub-systems. • Understand the importance of earthing, bonding, and surge protection in system design. • Identify relevant national/international	• Prepare work area, tools, and safety equipment according to standard procedures and risk assessments. • Inspect and verify mechanical components such as mounts, brackets, and enclosures for defects or compliance with design. • Pre-assemble or adjust mechanical components based on system layout and manufacturer guidelines. • Measure, cut, and prepare electrical cables and conduits according to the system requirements. • Route and secure cables, conduits, and protective coverings in accordance with safety standards and layout diagrams. • Perform basic mechanical fitting tasks such as drilling, fixing, and aligning structures. • Assemble electrical sub-systems, including terminal blocks, distribution panels, and connectors, as per wiring schematics. • Apply safe working practices, including lockout/tagout procedures and correct use of insulated tools. • Conduct pre-installation functional checks of sub-system components. • Maintain clear documentation of materials used, work performed, and compliance checks.

standards and safety regulations applicable to sub-system preparation. • Understand proper selection and usage of tools, materials, and personal protective equipment (PPE).	
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Switches, buzzers, LEDs and components such as diode, transformer, LED, transistor, capacitor, resistor, inductor, thermistor, ICs, screws, nuts, Push buttons, selector switches, meters, timers, connectors, other securing devices, Electrical sub-systems	

Module 2: Integration, Quality Control, and Productivity Standards

Mapped to ELE/N7310

Terminal Outcomes:

- Integrate components and systems while adhering to defined quality control procedures and standards.
- Ensure productivity targets are met through efficient workflow and compliance with quality benchmarks.

Duration: 75:00	Duration: 90:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Understand the concept and importance of system integration across mechanical, electrical, and software components. • Identify the key stages of integration in a project workflow (pre-integration checks, interfacing, final assembly). • Explain the principles of quality control (QC) and quality assurance (QA) in technical projects. • Recognize various types of defects, errors, and non-conformities that may occur during integration. • Understand productivity metrics and how they relate to time, resources, and output in technical work environments. • Interpret standard operating procedures (SOPs), quality benchmarks, and industry standards. • Describe the use of quality control tools such as checklists, inspection sheets, and testing protocols. • Understand the impact of rework, downtime, and waste on productivity and project timelines. • Prevent ESD using real-time production tracking dashboards, and automated test benches to ensure high performance. • Explain the role of documentation and reporting in ensuring quality compliance and process improvement.	• Prepare systems and sub-systems for integration by checking alignments, compatibility, and completeness. • Perform integration tasks by connecting mechanical and electrical interfaces as per specifications. • Use inspection tools (e.g., multimeter, torque wrench, level, software diagnostics) to verify quality of integration. • Conduct functional testing to ensure integrated components work together as designed. • Identify and document quality issues such as misalignments, electrical faults, or specification deviations. • Follow standard quality control procedures including checklists, inspection forms, and sign-offs. • Apply productivity-enhancing practices such as work sequencing, tool optimization, and time management techniques. • Monitor own work against quality and productivity targets and take corrective actions where required. • Maintain clean and organized workstations to support efficiency and prevent quality issues. • Report integration and quality outcomes clearly to supervisors using proper documentation formats.
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Sample Of Escalation Matrix, Organization Structure.	

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 Mechanical Fitter Electronics

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

Terminal Outcomes

1. Explain fundamentals of electricity such as Ohms law, difference between Ac and DC, series and parallel connections.
2. Explain basic electronics of components such as diode, transformer, LED, photo transistor, capacitor, resistor, inductor, thermistor, ICs.
3. Assemble the mechanical sub systems as per the standard assembly procedure.
4. Integrate the mechanical and electrical sub systems as per instructions in the work manual.
5. Use of professional language and behaviour that is respectful of PwD and all genders.
6. Administer first aid in case of a minor accident.
7. Use a fire extinguisher in case of a fire incident.

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Diploma/ITI/ CITS Certified in relevant Trade	Electronics/ Electrical/ Mechanical	1	Fitter	1	Trainer	

Trainer Certification	
Domain Certification	**Platform Certification**
"**Mechanical Fitter (Electronics)**", "ELE/Q6302, v4.0", Minimum accepted score is 80%	Recommended that the Trainer is certified for the **Mechanical Fitter – (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/ITI/ Certified in relevant CITS Trade	Electronics/ Electrical/ Mechanical	2	Fitter	1	Assessor	

Assessor Certification	
Domain Certification	**Platform Certification**
"**Mechanical Fitter Electronics**", "ELE/Q6302, v4.0", Minimum accepted score is 80%	Recommended that the Assessor is certified for the **Mechanical Fitter - 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