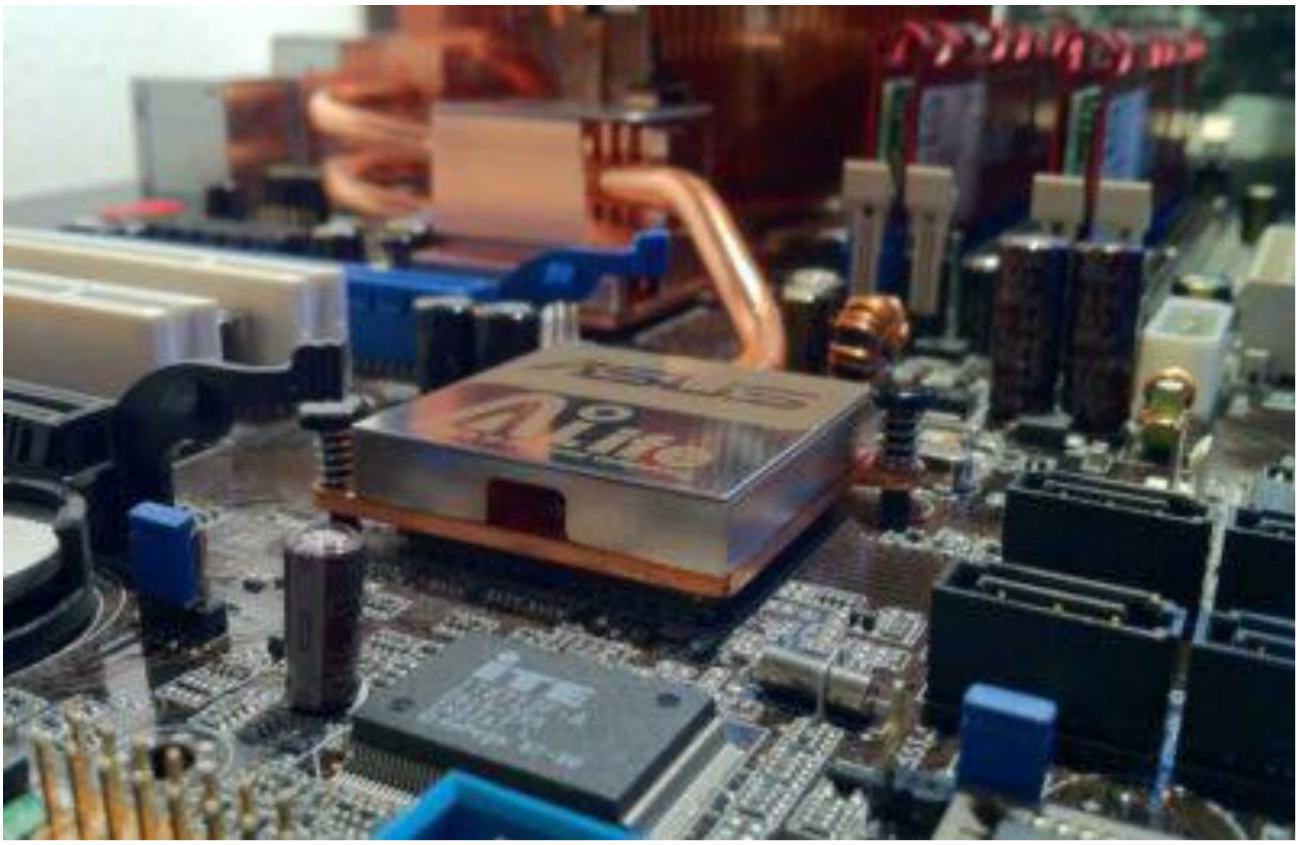

Model Curriculum

QP Name: Quality Supervisor (Consumer Goods)

QP Code: ELE/Q7901

QP Version: 5.0

NSQF Level: 5

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	Consumer Electronics & IT Hardware
Occupation	Quality Assurance
Country	India
NSQF Level	5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/1213.0101
Minimum Educational Qualification and Experience	Completed 2nd year of UG (UG Diploma) (Physics/ Electronics/Electrical/Mechanical) with 1.5 years of Relevant Experience OR Completed 3-year diploma (after 10th) (Electronics /Electrical/Mechanical) with 3 Years of Relevant Experience OR Previous relevant Qualification of NSQF Level (4.5) with 1.5 years of Relevant Experience # Relevant Experience in Consumer Electronics & IT Hardware.
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	01.05.2025
Next Review Date	30.04.2028
NSQC Approval Date	08.05.2025
QP Version	5.0
Model Curriculum Creation Date	01.05.2025
Model Curriculum Valid Up to Date	30.04.2028
Model Curriculum Version	5.0
Minimum Duration of the Course	570 Hours
Maximum Duration of the Course	570 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.

- Support design team and production team in the development of new medical device as per required quality standards.
- Conduct various functionality tests on medical devices as per SOP.
- Conduct testing of incoming and outgoing material as per SOP.
- Record all documents and coordinate with various departments.
- 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/N4632: Support Product Development with Quality Control	**66:00**	**54:00**	**90:00**	**00:00**	**210:00**
Module 1: Provide quality support for product development	66:00	54:00	90:00	00:00	210:00
ELE/N4633: Conduct quality tests and root-cause Analysis	**60:00**	**60:00**	**30:00**	**00:00**	**150:00**
Module 2: Perform quality tests and root-cause analysis	60:00	60:00	30:00	00:00	150:00
ELE/N7903: Perform incoming and outgoing material testing	**30:00**	**60:00**	**60:00**	**00:00**	**150:00**
Module 3: Perform incoming and outgoing material testing	30:00	60:00	60:00	00:00	150:00
DGT/VSQ/N0102: Employability Skills (60 Hours)	**24:00**	**36:00**	**00:00**	**00:00**	**60:00**
Module 4: Employability Skills (60 Hours)	24:00	36:00	00:00	00:00	60:00
Total Duration	**180:00**	**210:00**	**180:00**	**00:00**	**570:00**

Module Details

Module 1: Provide quality support for product development

Mapped to ELE/N4632

Terminal Outcomes:

- Support design team and production team in the development of new medical device as per required quality standards.
- Maintain and update records and documents as per organisational procedures.

Duration: *66:00*	**Duration**: *54:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Support in bridging the gap between the design team and product team related to new proto development. • Discuss the specifications and design details of the medical device under development received from the R&D team. • Describe different quality management systems like ISO13485, FDA, GMP, ISO 14971 etc. • Recall quality standards and regulations need to follow for the development of a medical device. • Elaborate different validation processes for components, process and design. • Describe basic principles of how the medical equipment functions, its operating sequence, the function of individual unit or components and how they interact. • Explain different types of electrical, electronic & mechanical components and their functionalities. • List the steps to be performed for designing the inspection and functional requirement specifications, functional and electrical safety test procedures and medical device test software for newly developed medical device. • Discuss need of monitoring the existing production processes by capturing data at various levels of production. • Describe process improvement methodologies like Lean, Six Sigma etc. • List necessary using tools, equipment and test software required for performing	• Show how to receive specifications and design details of the medical device under development from the R&D team. • Apply appropriate ways to that medical device under development is in accordance with quality standards and regulations. • Apply appropriate ways to interact with the design team and give inputs on selection of right components and parts for the new medical device. • Perform steps to design inspection and functional requirement specifications, functional and electrical safety test procedures and medical device test software for newly developed medical device with the support of design team. • Apply appropriate ways to monitor the existing production processes by capturing data at various levels of production. • Perform internal audits against applicable quality standards. • Apply appropriate ways to identify gaps and implement improvement methodologies reduce process variance and enhance product quality. • Prepare all required documents and records related to product development. • Show how to arrange necessary tools and equipment required for testing of newly developed medical device. • Show how to give theoretical and practical training to functional testers for performing functional tests on newly developed medical device at different stages of its production.

functional and electrical safety tests on newly developed medical device. • Discuss the need of organising theoretical and practical training to functional testers for performing functional tests on newly developed medical device at different stages of its production.	• Demonstrate manufacturer recommended procedure of using tools, equipment and test software for performing functional tests. • Apply appropriate ways to design quality tests for medical device to capture all its functional parameters.
Classroom Aids:	
Whiteboard, marker pen, computer or laptop attached to LCD projector, scanner, computer speakers	
Tools, Equipment and Other Requirements	
Basic tool box, Work bench with vice, Battery charger, High voltage battery, In vehicle power electronics, Riveting machine, drilling machine, riveting guns, pneumatic guns, fasteners, rubber seals, soldering iron, jigs, fixtures, adhesives, vernier calliper, micrometre, compass, divider, scriber, T Square, bevel protractor, pin set, torque meter Hand book, job orders, work order, completion material requests, and Technical Reference Books.	

Module 2: Perform quality tests and root-cause analysis

Mapped to ELE/N4633

Terminal Outcomes:

- Conduct various functionality tests on medical devices as per SOP.
- Maintain and update records and documents as per organisational procedures.

Duration: *60:00*	**Duration**: *60:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss how to confirm the testing tasks and type of tests required to be conducted on the product from the superior. • List testing equipment, measuring instruments, gauges, parts etc. required during the testing process. • Explain the selection criteria of testing equipment, measuring instruments, gauges, parts etc. required. • Recall the necessary precautions to avoid any hazard and accident during inspection and testing process. • List the steps to be performed for conducting functional tests i.e. Tube Seasoning test, Over KV test and Calibration, Dose-kVp Linearity test, Dose-mAs Linearity test, kVp Accuracy and repeatability test, HVL (Half Value Layer) test, Radiation output test, reproducibility test and reciprocity test on Xray device. • List the steps to be performed for conducting functional tests i.e. Monitor resolution test, Spatial distortion test, Grey scale uniformity test, Depth of visualization test, Low contrast visibility test, Display artefacts, Distance measurement test, Area estimation test and String object test on Ultrasonic device. • List the steps to be performed for checking the functionality of Patient Monitoring Devices. • List the steps to be performed for conducting various electrical safety tests i.e. Dielectric withstand (Hi-potential) test, Insulation resistance test, Leakage current test and Ground continuity test on medical device. • Describe root-cause analysis method.	• Apply appropriate ways to identify and select the testing equipment, measuring instruments, gauges, parts etc. required during the testing process. • Demonstrate organisational procedure for arranging testing equipment, measuring instruments, gauges, parts etc. required during the testing process. • Demonstrate the standard operating procedure to use testing equipment, tools, gauges and measuring instruments required during job. • Demonstrate how to set the test apparatus as per the selected testing process. • Perform steps to conduct various functional tests on Xray device. • Perform steps to conduct various functional tests on Ultrasonic device. • Show how to connect the Patient Monitoring Device to simulator(s) and Digital Storage Oscilloscope and start it. • Show how to take Patient Monitoring Devices graph measurements, parameters and Digital Storage Oscilloscopes readings and compare PMDs readings with simulators readings. • Perform steps of Dielectric withstand (Hi-potential) test, Insulation resistance test, Leakage current test and Ground continuity test for electrical safety of the medical device as per the SOP • Show how to compare test readings with the specified limits mentioned in the SOP and send the devices for electrical safety testing. • Perform steps of root-cause analysis on the failed medical devices as per the SOP. • Demonstrate organisational procedure of sending back the failed medical devices back to assembly line for reassembly along

	with reassembly / repair specific suggestions. • Prepare all required documents and records related to product testing.
Classroom Aids:	
Whiteboard, marker pen, computer or laptop attached to LCD projector, scanner, computer speakers	
Tools, Equipment and Other Requirements	
Basic tool box, Work bench with vice, Battery charger, High voltage battery, In vehicle power electronics, Riveting machine, drilling machine, riveting guns, pneumatic guns, fasteners, rubber seals, soldering iron, jigs, fixtures, adhesives, vernier calliper, micrometre, compass, divider, scriber, T Square, bevel protractor, pin set, torque meter Hand book, job orders, work order, completion material requests, and Technical Reference Books.	

Module 3: Perform incoming and outgoing material testing

Mapped to ELE/N7903

Terminal Outcomes:

- Conduct testing of incoming and outgoing material as per SOP.
- Maintain and update records and documents as per organisational procedures.

Duration: *30:00*	**Duration**: *60:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the steps to be performed for testing of incoming material. • List the steps to be performed for testing of out-going cartons. • Describe vibration test and its procedure.	• Perform steps to test incoming material as per SOP. • Show how to place plastic moulds of patient medical devices and other components in the cyclical chamber and set the temperature and humidity level of cyclical chamber. • Demonstrate use of multimeter for checking the plastic moulds physically and electrical & electronic components. • Perform steps to test out-going cartons as per SOP. • Apply appropriate ways to check that the carton is undamaged and packed as per the SOP • Apply appropriate ways to check that the medical device model and its specifications are mentioned correctly on the carton • Show how to check that the bar code mentioned on the label is correct • Show how to check that the carton is strapped properly • Demonstrate vibration test to check that it is safe for transportation.
Classroom Aids:	
Whiteboard, marker pen, computer or laptop attached to LCD projector, scanner, computer speakers	
Tools, Equipment and Other Requirements	
Basic tool box, Work bench with vice, Battery charger, High voltage battery, In vehicle power electronics, Riveting machine, drilling machine, riveting guns, pneumatic guns, fasteners, rubber seals, soldering iron, jigs, fixtures, adhesives, vernier calliper, micrometre, compass, divider, scriber, T Square, bevel protractor, pin set, torque meter Hand book, job orders, work order, completion material requests, and Technical Reference Books.	

Module 4: 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**
• 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.	• 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 workeffectively • 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 5: On-the-Job Training

Mapped to Quality Supervisor (Consumer Goods)

Mandatory Duration: *180:00*	**Recommended Duration**: *00:00*
Location: On Site	

Terminal Outcomes

1. Explain the fundamental concepts of electronics and electronics components
2. Support design team and production team in the development of new medical device as per required quality standards
3. Identify testing tools, equipment, gauges etc required for testing process
4. Conduct various functionality tests on medical devices as per SOP
5. Conduct testing of incoming and outgoing material as per SOP
6. Record the observations of test and compare them with the specified data as per SOP
7. Maintain and update records and documents as per organisational procedures
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/ Degree/ ITI/ Certified in relevant CITS Trade	(Electrical/Electronics/ Mechanical)	2	Quality Management - Electronics	1	Electronics	

Trainer Certification	
Domain Certification	**Platform Certification**
"**Quality Supervisor (Consumer Goods)**, ELE/Q7901, version 5.0". Minimum accepted score is 80%.	Recommended that the Trainer is certified for the **Quality Supervisor (Consumer Goods)** "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/ Degree/ ITI/ Certified in relevant CITS Trade	(Electrical/Electronics/ Mechanical)	3	Quality Management - Electronics	1	Electronics	

Assessor Certification	
Domain Certification	**Platform Certification**
"**Quality Supervisor (Consumer Goods)**, ELE/Q7901, version 5.0". Minimum accepted score is 80%.	Recommended that the Assessor is certified for the **Quality Supervisor (Consumer Goods)** "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