



Model Curriculum

QP Name: Mechanical Engineering and Plumbing General Manager (Electronics)

QP Code: ELE/Q7103

QP Version: 3.0

NSQF Level: 6

Model Curriculum Version: 3.0

Electronics Sector Skills Council of India (ESSCI) ESC House, 2nd Floor ESC House, Okhla Industrial Area-
Phase 1II New Delhi-II0020

Table of Contents

Training Parameters.....	3
Program Overview	4
Training Outcomes.....	4
Compulsory Modules	4
Module 1: Manage the tendering, sub-contracting and planning processes for MEP Projects.....	6
Module 2: Manage the MEP project execution, commissioning, testing and handover processes.....	8
Module 3: Internal organizational-level responsibilities	10
Module 4: Employability Skills (60 Hours).....	12
Module 5: On-the-Job Training	13
Annexure.....	14
Trainer Requirements	14
Assessor Requirements.....	15
Assessment Strategy.....	16
References	18
Glossary.....	18
Acronyms and Abbreviations	19

Training Parameters

Sector	Electronics
Sub-Sector	Industrial Automation
Occupation	Engineering-I&A
Country	India
NSQF Level	6
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7411.0100
Minimum Educational Qualification and Experience	Completed 4 year UG program (Physics/Electronics/Electrical/Mechanical) with 2 Years of experience Relevant Experience in Industrial Automation OR Completed 3 year UG degree (Physics/Electronics/Electrical/Mechanical) with 2 Years of experience Relevant Experience in Industrial Automation. OR Completed 3 year diploma after 10th (Electronics/Electrical/Mechanical) with 4.5 years of experience Industrial Automation OR Previous relevant Qualification of NSQF Level (5.5) with 1.5 years of experience Industrial Automation # Relevant Exp in Industrial Automation
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	4.0
Model Curriculum Creation Date	01.05.2025
Model Curriculum Valid Up to Date	30.04.2028
Model Curriculum Version	4.0
Maximum Duration of the Course	660 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 managing the tendering, sub-contracting and planning processes.
- Describe the process of managing the MEP project execution, commissioning, testing and handover processes.
- Demonstrate the process of carrying out internal organisational-level responsibilities.
- 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/N7106: Manage the tendering, sub-contracting and planning processes for MEP projects	66:00	54:00	00:00	90:00	210:00
Module 1: Management of tendering, sub-contracting and planning processes for MEP projects	66:00	54:00	00:00	90:00	210:00
ELE/N7107: Manage the MEP project execution, commissioning, testing and handover processes	90:00	90:00	00:00	90:00	270:00
Module 2: Management of MEP project execution, commissioning, testing and handover processes	90:00	90:00	00:00	90:00	270:00
ELE/N7108: Carry out internal organizational-level responsibilities	30:00	60:00	00:00	30:00	120:00
Module 3: Internal organizational-level responsibilities	30:00	60:00	00:00	30:00	120:00
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	90:00
Total Duration	210:00	240:00	00:00	210:00	660:00

Module Details

Module 1: Management of tendering, sub-contracting and planning processes for MEP projects

Mapped to ELE/N7106

Terminal Outcomes:

- Demonstrate the process of selecting tenders and preparing the tender proposal.
- Illustrate the process of submitting the tender proposal and making presentations.
- Describe the process of selecting the sub-contractors.
- Demonstrate the process of carrying out planning for the delivery of the MEP project.

Duration: 66:00	Duration: 54:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
- Describe the process of identifying suitable MEP tenders and determining the scope of work. - Describe the process of preparation of MEP shop drawing, specification and Bill of Quantities (BOQ) along with budgeting. - Describe the process of analysing the blueprints, project documents and specifications to prepare accurate cost, materials and labour estimates for all projects. - Explain how to prepare the tender proposal and use appropriate software tools for the purpose. - Describe the process of submitting the tender proposal, make presentations and conducting negotiations. - List the relevant documentation to be completed on winning a contract. - Describe the process of inviting bids and selecting sub-contractors. - Describe the process of planning the delivery of MEP project such as preparing the MEP design, seeking approval of BOQ, Goods for Construction (GFC)/ General	- Demonstrate the process of analysing the tenders and shortlisting those that the organisation is eligible to apply for, establishing the scope of work and any specific requirements. - Dramatize the process of analysing the blueprints, project documents and specifications to prepare accurate cost, materials and labour estimates for all project stages. - Demonstrate how to prepare Tender Check Estimates (TCE) for contracts and bills of materials, including Electrical, Mechanical and Plumbing quantities, drawings, and technical specifications. - Demonstrate how to perform detailed calculations to compute and establish construction and installation standards and specifications. - Demonstrate how to prepare the tender proposal in the prescribed format. - Roleplay how to carry out presentations and negotiations with the prospective client. - Demonstrate the process of carrying out necessary documentation after

Arrangement (GA) drawings and shop drawings, resource procurement and scheduling.	winning the bid and soliciting feedback for the failed bids.
● Explain the importance of selecting a team of skilled managers, engineers and support staff to work on the execution of MEP projects. ● Elaborate the use of various software tools for planning and scheduling.	● Dramatize how to prepare customised bids and take-offs/ Bill of Quantities (BOQ) for MEP sub-contractors. ● Dramatize how to evaluate the bids to shortlist sub-contractors and finalise a sub-contractor. ● Demonstrate the process of carrying out planning and scheduling according to the Service Level Agreement (SLA) signed with the client.
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Mechanical, Electrical, And Plumbing Components such as Elevators, Escalators, Heating and Air-Conditioning Systems, Heating and Cooling Changed	

Module 2: Management of MEP project execution, commissioning, testing and handover processes

Mapped to ELE/N7107

Terminal Outcomes:

- Demonstrate the process of managing MEP installation, commissioning, testing and handover process.
- Describe the process of managing the client and sub-contractor relationships.
- Demonstrate the process of carrying out documentation.

Duration: 90:00	Duration: 90:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
● Describe the process of obtaining the fire No Objection Certificate (NOC) and Occupancy Certificate (OC) from the relevant authorities. ● Describe the process of installation of various systems such as STP, WTP, HVAC and lifts. ● Elaborate the process of installation of various equipment such as a substation, High Tension (HT)/ Low Tension (LT) Panels, Transformer, Diesel Generator (DG) sets. ● Describe the process of conduiting, electrical wiring, rising main and other internal low side and high side electrical work. ● Explain the importance and process of installing LV distribution, lighting and power circuits, telephone/ data system, access control etc. ● Explain the importance of monitoring the execution of MEP work. ● Describe the process of commissioning and testing various MEP systems and equipment. ● Describe the process of handing over after the completion of MEP installation and the necessary documentation to be done. ● Explain the importance of auditing the performance of MEP sub-contractors.	● Demonstrate the process of managing the installation of various systems such as Sewage Treatment Plant (STP), Waste Treatment Plant (WTP), Heating, Ventilation, and Airconditioning (HVAC) and lifts. ● Demonstrate the process of managing the installation of various equipment such as a substation, High Tension (HT)/ Low Tension (LT) Panels, Transformer, Diesel Generator (DG) sets. ● Dramatize how to manage the MEP execution, commissioning and testing process through coordination with the relevant personnel and departments. ● Demonstrate the process of carrying out post-tender activities until the handing over and completion of the defects liability period of the project. ● Demonstrate the process of auditing the performance of MEP sub-contractors and take appropriate action as required. ● Demonstrate the process of verifying the MEP contractors bills and co-ordinate with the finance team for their processing. ● Prepare sample reports such as project progress reports using the relevant software tools.

- Explain the importance of ensuring compliance with the regulatory and organisation's Quality, Health, Safety and Environment (QHSE) guidelines.
- Explain the importance and process of preparing and reviewing the relevant MEP project-related reports.

Classroom Aids

Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop

Tools, Equipment and Other Requirements

Mechanical, Electrical, And Plumbing Components such as Elevators, Escalators, Heating and Air-Conditioning Systems, Heating and Cooling Changed

Module 3: Internal organisational-level responsibilities Mapped to ELE/N7108

Terminal Outcomes:

- Describe the process of managing staffing and daily operations.
- Explain the importance of arranging for the training of the MEP team and mentoring them.
- Describe the process of managing the department finances.
- Describe the process of carrying out miscellaneous managerial responsibilities.

Duration: 30:00	Duration: 60:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
- Describe the process of developing key performance goals for functions and direct reports. - Describe the process of staffing and ensuring staff with the required skills are deployed at different levels of project delivery. - Describe the process of identifying knowledge and skills gaps among the various MEP departments in the organisation through internal audits and surveys. - Explain the importance of arranging regular training for the MEP workforce and mentoring them. - Explain how to carry out budgeting, production planning, and maintain inventory levels. - Outline profit and Loss (P&L) management. - Describe the process of devising strategies for business growth and seeking the approval of the (BOD). - Explain the importance of analysing the expenditure to ensure compliance with the set budget. - Describe the process of carrying out a risk assessment and contingency planning. - Explain the importance of ensuring control on the distribution of information among the client,	- Demonstrate the process of managing the daily operations of the business unit such as budgeting, production planning, inventory management. - Roleplay how to lead and mentor a team of mechanical and electrical managers to achieve the best results in line with the agreed goals. - Demonstrate the process of carrying out Profit and Loss (P&L) management and devise strategies to grow the business. - Demonstrate the process of reviewing and analysing the expenditure. - Demonstrate the process of carrying out a risk assessment and contingency planning, and communicate the same to internal and external stakeholders. - Dramatize how to develop and execute strategies to identify and connect with potential clients.

internal departments and sub-contractors.	
• Elaborate how to streamline business processes and develop effective operations plans to achieve the organisational objectives. • Describe the process of developing and executing strategies to identify and connect with potential clients.	
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Mechanical, Electrical, And Plumbing Components such as Elevators, Escalators, Heating and Air-Conditioning Systems, Heating and Cooling Changed	

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 work effectively • 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 Mechanical Engineering and Plumbing General Manager (Electronics)

Mandatory Duration: 210:00	Recommended Duration: 00:00
Location: On-Site	
Terminal Outcomes 1. Demonstrate how to select, analyse and shortlist the tenders. 2. Prepare Tender Check Estimates (TCE) for contracts and bill of materials 3. Prepare the tender proposal in the prescribed format, highlighting the organisation's eligibility for the tender. 4. Prepare customised bids and take-offs/ Bill of Quantities (BOQ) for MEP sub-contractors. 5. Manage the installation of various systems and equipment such as Sewage Treatment Plant (STP), Waste Treatment Plant (WTP) and High Tension (HT)/ Low Tension (LT) Panels, Transformer, Diesel Generator (DG) sets. 6. Perform all post-tender activities until the handing over and completion of the defects liability period of the project. 7. Audit the performance of MEP sub-contractors and take appropriate action as required. 8. Lead and mentor a team of mechanical and electrical managers to achieve the best results. 9. Perform budgeting, production planning, staffing, and maintain inventory levels. 10. Perform risk assessment and contingency planning, and communicate the same to internal and external stakeholders.	

Trainer Requirements

Annexure

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
B.E./ B. Tech/ Certified in relevant CITS Trade	(Degree in Electrical/ Electronics/ Mechanical Engineering)	5	Industrial Automation	2	Electronics	

Trainer Certification	
Domain Certification	Platform Certification
“Mechanical Engineering and Plumbing General Manager (Electronics)” , “ELE/Q7103, v3.0”, Minimum accepted score is 80%	Recommended that the Trainer is certified for the Mechanical Engineering and Plumbing General Manager (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	
B.E./ B. Tech/ Certified in relevant CITS Trade	(Degree in Electrical/ Electronics/ Mechanical Engineering)	7	Industrial Automation	2	Electronics	

Assessor Certification	
Domain Certification	Platform Certification
“Mechanical Engineering and Plumbing General Manager (Electronics)”, “ELE/Q7103, v3.0”, Minimum accepted score is 80%	Recommended that the Assessor is certified for the Mechanical Engineering and Plumbing General Manager (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 levels 1 to 3 are for the unskilled & semi-skilled individuals, and levels 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	The 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	The 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
BOQ	Bill of Quantities
DC	Direct Current
DG	Diesel Generator
GA	General Arrangement
GFC	Goods for Construction
HT	High Tension
HVAC	Heating, Ventilation, and Airconditioning
ISO	International Organization for Standardization
LT	Low Tension
MEP	Mechanical, Engineering and Plumbing
NOC	No Objection Certificate
NCO	National Occupational Standards
NOS	National Skills Qualification Committee
NSQF	National Skills Qualification Framework
OC	Occupancy Certificate
OJT	On-the-Job Training
OMR	Optical Mark Recognition
P&L	Profit & Loss
PC	Performance Criteria
PwD	Persons with Disabilities
QP	Qualification Pack
QHSE	Quality, Health, Safety and Environment
STP	Sewage Treatment Plant
SLA	Service Level Agreement
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
TCE	Tender Check Estimates
ToA	Training of Assessors
ToT	Training of Trainers
TP	Training Provider
WTP	Waste Treatment Plant