Model Curriculum

QP Name: AI Devices Installation Operator

QP Code: TEL/Q6102

QP Version: 1.0

NSQF Level: 3

Model Curriculum Version: 1.0

Telecom Sector Skill Council
Estel House, 3rd Floor, Plot No: - 126, Sector 44
Gurugram, Haryana 122003

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Training Parameters

Sector	Telecom
Sub-Sector	Network Managed Services
Occupation	Network (Active Components) Installation
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7421.6102
Minimum Educational Qualification & Experience	Class 10th Pass **OR** Class 8th Pass and pursuing continuous regular schooling **OR** Class 8th Pass + ITI (2 years in Electronics/Telecom/IT and other relevant fields)
Pre-Requisite License or Training	NA
Minimum Job Entry Age	15 Years
Last Reviewed On	30/06/2022
Next Review Date	30/06/2025
NSQC Approval Date	30/06/2022
QP Version	1.0
Model Curriculum Creation Date	30/06/2022
Model Curriculum Valid Up to Date	30/06/2025
Model Curriculum Version	1.0
Minimum Duration of the Course	390 Hours
Maximum Duration of the Course	390 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 steps for installing AI devices at customer premises.
- Perform post installation activities to establish AI connectivity.
- Carry out predictive maintenance using AI devices.
- Optimize resources, work efficiently and adhere to safety standards.
- Interact effectively with others while being sensitive of gender and persons with disabilities.

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
Bridge Module	**08:00**	**04:00**	**00:00**	**-**	**12:00**
Module 1: Role and Responsibilities of an AI Devices Installation Operator	08:00	04:00	00:00	-	12:00
TEL/N6106 – Preparing for Installation of AI Devices **NOS Version No. 1.0** **NSQF Level 3**	**28:00**	**30:00**	**40:00**	**-**	**98:00**
Module 2: Preparing for Installation of AI Devices	28:00	30:00	40:00	-	98:00
TEL/N6107 – Install AI Devices in the Proposed Business Model **NOS Version No. 1.0** **NSQF Level 3**	**20:00**	**32:00**	**40:00**	**-**	**92:00**
Module 3: Installing AI Devices	20:00	32:00	40:00	-	92:00
TEL/N6108 – Predictive maintenance using AI devices **NOS Version No. 1.0** **NSQF Level 3**	**32:00**	**36:00**	**40:00**	**-**	**108:00**

Module 4: Performing predictive maintenance using AI devices	32:00	36:00	40:00	-	108:00
TEL/N9101 – Organize work and resources as per health and safety standards **NOS Version No. 1.0** **NSQF Level 4**	**16:00**	**24:00**	**00:00**	**-**	**40:00**
Module 5: Optimize resources and workeffectively and safely	16:00	24:00	00:00	-	40:00
TEL/N9102– Interact effectively with team members and customers **NOS Version No. 1.0** **NSQF Level 4**	**16:00**	**24:00**	**00:00**	**-**	**40:00**
Module 6: Communication and interpersonal skills	16:00	24:00	00:00	-	40:00
Total Duration	**120:00**	**150:00**	**120:00**	**-**	**390:00**

Module Details

Module 1: Introduction to the Role of an AI Devices Installation Operator
Mapped to Bridge Module

Terminal Outcomes:

- Describe the role and responsibilities to be performed by an AI Devices Installation Technician.
- Explain the scope of work for an AI Devices Installation Technician.

Duration: *08:00*	**Duration**: *04:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the size and scope of the Telecom industry and its various sub-sectors. • Explain the role and responsibilities of an AI Devices Installation Technician. • Discuss the organisational policies on workplace ethics, managing sites, quality standards, personnel management and public relations (PR). • Describe the process workflow in the organization and the role of an AI Devices Installation Technician in the process. • List the various daily, weekly, monthly operations/activities that take place at the site under an AI Devices Installation Technician.	• Evaluate case studies outlining the role, responsibilities, and challenges for an AI Devices Installation Technician. • Analyse the requirements for the course and prepare an action/learning plan for updating skills as per the pre-requisites of the course.
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	
Documents of standard operating procedures, code of conduct, checklists, schedules tools and equipment, status report	

Module 2: Preparing for Installation of AI Devices
Mapped to TEL/N6106 v1.0

Terminal Outcomes:

- Perform activities related to requirements analysis.
- Demonstrate the steps for collating data based.

Duration: *28:00*	**Duration**: *30:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Identify the primary optimization requirements of the customer in terms of security, asset, performance, etc. • Describe the basic functions and applications of AI. • Outline the AI use cases and typical applications in the Telecom sector. • Explain how to analyse the current business model of the customer to formulate AI solution for improving and testing its feasibility. • Distinguish between the emergency services AI (continuity and accuracy) and AI for mass data analytics (volume and sample size). • Explain the implementation of IoT in different sectors including manufacturing, transportation, and so on. • Coordinate with the manager to provide a suitable business model (AI devices, their quantity, location, support applications etc.) based on the customer requirements and specifications. • Describe the process for analysing the collected data about trending technologies and their application in the business model. • List the products, competitors and landscapes to ensure the reliability/preferences on AI devices for the proposed AI solution.	• Employ various techniques to collect performance reports of previously installed devices such as sensors, biometric, etc. • Implement the steps to test performance of devices to supply chain and logistics operations. • Perform the steps for establishing connectivity of devices with robotics and AI. • Demonstrate how to collect data for industry trends from various reliable sources and use it for solution development and their application for the AI devices proposed. • Demonstrate how to evaluate the selected supplier on the basis of solution performance, geographic availability, support services and security, etc. • Perform the steps to check the AI devices for real-time data optimization as per requirements and specifications.
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	

Tools and equipment, different AI devices Service Manual/User Manuals, Customer Registration, Program Authentication Form, Customer Feedback form

Module 3: Installing AI Devices
Mapped to TEL/N6107 v1.0

Terminal Outcomes:

- Perform pre-installation activities.
- Demonstrate the steps for routing of installed devices.

Duration: *20:00*	**Duration**: *32:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Define the business systems implementation for efficient interaction between devices. • Outline the business intelligence and various associated developer/engineer and data scientist roles involved in the installation process. • Describe the basics of machine learning (ML), and the research and science involved in the application of AI. • Identify the basic connectivity, network and communication protocol requirements. • Explain the prerequisites for basic elements for installation, set up and connection of the devices. • Identify the embedded systems and analyse their effectiveness for collating and monitoring data. • List the types of micro-processor boards need to be integrated as per the current required setup on site. • Illustrate the types of features required for devices such as Connectivity, Analyzing, Integrating, etc. • Describe the functioning of sensors to check their requirement for the current business model. • Emphasize on the importance of assessing the application of sensors fitment to the business model. • Explain the application of short- and long-range protocols for the surveillance cameras. • List the software/hardware required to achieve optimal output in the proposed solution.	• Perform the steps to analyse if the model fits the architectural design of the building. • Implement various methods to establish the working process including Data Collection, Device Integration, Real-Time Analytics, Application and Process Extension. • Demonstrate how to use tools and techniques for monitoring and improvising the network performance. • Employ various techniques for testing the sensors and actuators. • Demonstrate how to install and use the smart devices that use embedded systems to collect, send and act on data they acquire from their environment.
Classroom Aids:	
Laptop, white board, marker, projector	

Tools, Equipment and Other Requirements
Processors, controllers, sensors and communication hardware Types of microprocessor boards like Arduino, raspberry-Pi, customized platforms etc. Devices such as humidity sensor, temperature sensor, gyro meter, accelerometer, video surveillance cameras Tools and equipment

Module 4: Performing Predictive Maintenance Using AI Devices
Mapped to TEL/N6108 v1.0

Terminal Outcomes:

- Perform predictive maintenance of the devices.
- Implement techniques for application of virtual assistants.
- Maintain documentation.

Duration: *32:00*	**Duration**: *36:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Identify the use of different types of predictive analytics software and virtual assistants. • List the standard fault-finding (troubleshooting) techniques. • Explain how to use AI to understand the relationship between sensors. • Describe how to prepare a preventive maintenance strategy with the team. • Emphasize on the importance of timely coordination with the superiors/team members to complete the activities. • Define the procedure to provide timely information about on-going maintenance works, outages and general regulatory. • Outline how to update and prioritise tickets for human agents if issues are not resolved. • Emphasize the significance of reporting all incidents and requests and logging these properly in reports/records. • Explain how to coordinate with authority for documents validation and verification to check for any anomalies in the working of the devices.	• Demonstrate how to use the various testing tools. • Perform the steps to use UE simulators like Aeroflex TM500 and Keysight and debuggers like QXDM, XCAL and TEMS, channel and network Emulators. • Implement various techniques to record the warning notifications and diagnosis of equipment provided by predictive analytics software and analyse these to perform maintenance. • Demonstrate how to fix the faults on site. • Employ different techniques to perform tests and run system health checks for initial troubleshooting phase of the device. • Perform the steps to run call detail records (CDRs)/ trace. • Employ the methods to timely collect and record data in various formats (PDF/XML/HTML/DOC) to generate required diagnostic and other reports.
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	
Processors, controllers, sensors and communication hardware Types of microprocessor boards like Arduino, raspberry-Pi, customized platforms etc. Devices such as humidity sensor, temperature sensor, gyro meter, accelerometer, video surveillance cameras	

Module 5: Organize Work and Resources as per Health and Safety Standards
Mapped to TEL/N9101 v1.0

Terminal Outcomes:

- Plan work effectively, implement safety practices and optimize use of resources.

Duration: *16:00*	**Duration**: *24:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the recent skills and technologies prevalent in the telecom industry. • Discuss some commonly occurring problems with their causes and solutions. • State the importance of keeping the workplace clean, safe and tidy. • Outline the organizational structure to assign duties and responsibilities to each team member. • List different types of hazards and the procedure to report it to the supervisor. • List the precautionary steps one needs to follow while handling hazardous materials. • State the importance of participating in fire drills and other safety workshops. • Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol-based hand sanitizers. • List the different methods of cleaning, disinfection, sanitization etc. • Define self-quarantine or self-isolation. • Explain the path of disease transmission. • Discuss organizational hygiene and sanitation guidelines and ways of reporting breaches/gaps if any. • Explain the ways to optimize usage of resources. • Discuss various methods of waste management and its disposal. • List the different categories of waste for the purpose of segregation. • Differentiate between recyclable and non-recyclable waste. • State the importance of using appropriate colour dustbins for different types of waste. • Discuss the common sources of pollution and ways to minimize it.	• Prepare a time schedule to complete the tasks on the given time. • Demonstrate the use of safety equipment such as goggles, gloves, ear plugs, shoes etc. • Demonstrate the correct postures while working and handling hazardous materials at the workplace. • Demonstrate how to evacuate the workplace in case of an emergency. • Show how to sanitize and disinfect one's work area regularly. • Demonstrate the correct way of washing hands using soap and water. • Demonstrate the correct way of sanitizing hands using alcohol-based hand rubs. • Display the correct way of wearing and removing PPE such as face masks, hand gloves, face shields, PPE suits, etc. • Demonstrate warning labels, symbols and other related signages. • Perform basic checks to identify any spills and leaks and that need to be plugged /stopped. • Demonstrate different disposal techniques depending upon different types of waste. • Employ different ways to clean and check if equipment/machines are functioning as per requirements and report malfunctioning, if observed. • Employ ways for efficient utilization of material and water. • Use energy efficient electrical appliances and devices to ensure energy conservation.

Classroom Aids:
White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector
Tools, Equipment and Other Requirements
Personal Protection Equipment: safety glasses, head protection, rubber gloves, safety footwear, warning signs and tapes, fire extinguisher and first aid kit

Module 6: Communication and Interpersonal Skills
Mapped to TEL/N9102 v1.0

Terminal Outcomes:

- Communicate effectively and develop interpersonal skills
- Develop sensitivity towards differently abled people.

Duration: *16:00*	**Duration**: *24:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the importance of following the standard operating procedures of the company w.r.t. priority, confidentiality and security. • Outline the organizational structure to receive work instruction and report issues to the supervisor. • Discuss the importance of having timely discussions with all genders to avoid repeated errors. • State the importance of co-ordinating and resolving conflicts with the team members to achieve smooth workflow. • Discuss about the different types of disabilities with their respective issues. • State the work ethics, workplace etiquettes as well as standards and guidelines for all genders and PwD. • List health and safety requirements for persons with disability. • Describe the rights, duties and benefits available at workplace for person with disability. • Explain the process of recruiting people with disability for a specific job. • Discuss the specific ways to help people with disability to overcome the challenges.	• Use different modes of communication as per requirement and need. • Prepare a sample report of the commonly occurring errors and their solutions. • Use inclusive language irrespective of the gender/ disability of the person. • Demonstrate appropriate behaviour towards all genders and differently abled people. • Prepare a list of institutes and government schemes that help PwD in overcoming challenges. • Demonstrate the ideal behaviour with a PwD in an organization.
Classroom Aids:	
White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector	
Tools, Equipment and Other Requirements	
Sample of escalation matrix, organisation structure.	

Module 7: On-the-Job Training
Mapped to AI Devices Installation Operator

Mandatory Duration: *120:00*	**Recommended Duration**: *00:00*
Location: On-Site	

Terminal Outcomes

1. Collate performance reports of previously installed devices such as sensors, biometric, etc.
2. Validate and test performance of devices to supply chain and logistics operations.
3. Demonstrate establishing connectivity of devices with robotics and AI.
4. Accumulate data for industry trends from various reliable sources.
5. Evaluate the selected supplier.
6. Test the AI devices for real-time data optimization as per requirements and specifications.
7. Establish the working processes such as Data Collection, Device Integration, Real-Time Analytics, Application and Process Extension.
8. Monitor and improvise the network performance.
9. Test the sensors and actuators.
10. Install and use the smart devices.
11. Demonstrate how to use the various testing tools.
12. Use UE simulators, emulators and debuggers.
13. Record warning notifications and diagnosis of equipment provided by predictive analytics software and analyse these to perform maintenance.
14. Troubleshoot and fix the faults on site.
15. Run tests and system health checks.
16. Run call detail records (CDRs)/ trace.
17. Record data in various formats (PDF/XML/HTML/DOC) to generate required diagnostic and other reports.

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Diploma after 10th Class	Science/Electronics/Telecom /IT and other related domains	4	Active Networks/IoT Domain	0	NA	Eligible for ToTprogram
Graduate	Science/Electronics/Telecom /IT and other relevant domains	1	Active Networks/IoT Domain	0	NA	Eligible for ToT program

Trainer Certification	
Domain Certification	**Platform Certification**
Job Role "**AI Devices Installation Operator**", "TEL/Q6102, v1.0", Minimum accepted score is 80%	Job Role: "**Trainer**", "MEP/Q2601 v1.0", Minimum Accepted score is 80%

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Diploma after 10th Class	Science/Electronics/Telecom/IT and other related domains	4	Active Networks/IoT Domain	0	NA	Eligible for ToA program
Graduate	Science/Electronics/Telecom/IT and other relevant domains	1	Active Networks/IoT Domain	0	NA	Eligible for ToA program

Assessor Certification	
Domain Certification	**Platform Certification**
Job Role "**AI Devices Installation Operator**", "TEL/Q6102, v1.0", Minimum accepted score is 80%	Job Role: "**Assessor**", "MEP/Q2701 v1.0", Minimum Accepted score is 80%

Assessment Strategy

1. Assessment System Overview:

    - Batches assigned to the assessment agencies for conducting the assessment on SDSM/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
    - Center 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

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 Outcome	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 task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
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

AC	Air Conditioner
DG	Diesel Generator
PIU	Power Interface Unit
SMPS	Switch Mode Power Supply
BB	Battery Bank
IPMS	Integrated Power Management System
OPCO	Operating Company
PM	Preventive Maintenance
OPEX	Operating Expenditure
PPE	Personal Protective Equipment
RCA	Root Cause Analysis
PwD	Persons with Disabilities
CRM	Customer Relationship Management
EB	Electricity Board
RFS	Radio Frequency Services
NOC	Network Operating Centre
SRN	Service Request Number