



Model Curriculum

QP Name: Information and Communication Technology (ICT) Technician

QP Code: TEL/Q6206

QP Version: 2.0

NSQF Level: 4

Model Curriculum Version: 1.0

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Training Parameters

Sector	Telecom
Sub-Sector	Network Managed Services
Occupation	Network Operation and Maintenance
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3114.0802
Minimum Educational Qualification & Experience	Class 12 th OR Class 10 th + ITI OR Diploma (Science/Electronics/Telecom/IT and other relevant fields)
Pre-Requisite License or Training	NA
Minimum Job Entry Age	17 Years
Last Reviewed On	27/01/2022
Next Review Date	27/01/2025
NSQC Approval Date	27/01/2022
Version	2.0
Model Curriculum Creation Date	27/12/2021
Model Curriculum Valid Up to Date	27/01/2025
Model Curriculum Version	1.0
Minimum Duration of the Course	480 Hours, 0 Minutes
Maximum Duration of the Course	480 Hours, 0 Minutes

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.

- Identify the role, responsibilities and scope of work of an Information and Communication Technology (ICT) Technician
- Demonstrate how to manage ICT site hygiene.
- Implement appropriate techniques for carrying out preventive and corrective maintenance at ICT nodes.
- Identify how to optimize operations at the ICT site.
- Discuss how to plan work effectively, implement safety practices and optimize use of resources.
- Demonstrate how to communicate, develop interpersonal skills and become gender and Person with Disability (PwD) sensitive.

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	00:00	00:00	00:00	08:00
Module 1: Role and Responsibilities of an ICT Technician	08:00	00:00	00:00	00:00	08:00
TEL/N6222: Manage Information and Communication Technology (ICT) Site Hygiene NOS Version No. 2.0 NSQF Level 4	42:00	56:00	40:00	00:00	148:00
Module 2: Managing ICT Site Hygiene	42:00	56:00	40:00	00:00	148:00
TEL/N6223: Perform Preventive and Corrective Maintenance at ICT Nodes NOS Version No. 2.0 NSQF Level 4	36:00	52:00	40:00	00:00	136:00
Module 3: Preventive and Corrective Maintenance of ICT Nodes	36:00	52:00	40:00	00:00	136:00

TEL/N6224: Manage Information and Communication Technology (ICT) Site for Optimal Operation NOS Version No. 2.0 NSQF Level 4	32:00	54:00	40:00	00:00	138:00
Module 4: ICT Nodes Operations Optimization	32:00	54:00	40:00	00:00	138:00
TEL/N9101 – Organise Work and Resources as per Health and Safety Standards NOS Version No. 1.0 NSQF Level 4	16:00	24:00	00:00	00:00	40:00
Module 5: Plan Work Effectively, Optimise Resources and Implement Safety Practices	16:00	24:00	00:00	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	00:00	40:00
Module 6: Communication and interpersonal skills	16:00	24:00	00:00	00:00	40:00
Total Duration	150:00	210:00	120:00	00:00	480:00

Module Details

Module 1: Role and Responsibilities of an ICT Technician *Bridge Module*

Terminal Outcomes:

- Identify the role and responsibilities of an ICT Technician.

Duration: 08:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the size and scope of the Telecom industry and its various sub-sectors. • Discuss the various opportunities for an ICT Technician in the Telecom industry. • List the role and responsibilities of an ICT Technician. • Analyse the organisational policies on incentives, delivery standards, personnel management and public relations (PR) pertinent to the job role. • Discuss the importance of seeking help from experts during any stage of main activity in order to avoid any escalation. 	
Classroom Aids:	
Laptop with software like MS Office and internet, white board, marker, projector	
Tools, Equipment and Other Requirements	

Module 2: Managing ICT Site Hygiene

Mapped to TEL/N6222 v1.0

Terminal Outcomes:

- Demonstrate how to maintain basic site hygiene.
- Discuss the formalities and formats for proper documentation of site layout.
- Perform necessary steps to report problems to the supervisor.

Duration: 42:00	Duration: 56:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Identify the basic fundamentals and functioning of ICT equipment and nodes and applications (such as Secure CRT, Hyper terminal etc.). • Explain the Standard Operating Procedure (SOP) for maintaining cleanliness of ICT equipment as per the standards. • Describe how to monitor power consumption (including power cost and site up-time) for identifying patterns in power usage, and report discrepancies to the supervisor. • Discuss the importance of maintaining a list of required equipment, racks etc. with the site team as well as timely updates of equipment maintenance reports and records. • Explain the use of proper instructions and checklists for preventive maintenance and site hygiene at ICT nodes. • Identify the organizational reporting hierarchy/structure for escalations as well as for reporting observed faults and issues in the equipment. • Discuss the importance of Synchronous Digital Hierarchy (SDH) and Dense Wavelength Division Multiplexing (DWDM) technology for ICT site upkeep. 	<ul style="list-style-type: none"> • Demonstrate how to properly place equipment racks, as per the asset layout plan, at the ICT site for ensuring mechanical stability. • Implement proper maintenance techniques for upkeep of various equipment, such as Base Transceiver Station (BTS), nodeB, router, transmission equipment etc., as per ICT standards. • Prepare the site layout document as per organisation standards and formats. • Employ prescribed methods for reporting emergency situations like system failure, fire, power failure etc. to the authorized personnel.
Classroom Aids:	
Laptop with software like MS Office and Internet, White board, Marker, Projector	
Tools, Equipment and Other Requirements	
ICT nodes, applications (like Secure CRT, Hyper terminal), basic ICT equipment, Base Transceiver Station (BTS), nodeB, router, transmission equipment, power measurement devices/equipment	

Module 3: Preventive and Corrective Maintenance of ICT Nodes

Mapped to TEL/N6223 v1.0

Terminal Outcomes:

- Demonstrate proper techniques for preventive maintenance of ICT site equipment.
- Discuss how to timely and appropriately respond to network alarms/trouble tickets.
- Carry out rectification of fault conditions.

Duration: 36:00	Duration: 52:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the PM schedule and norms received from the supervisor and clarify doubts, if any. • Explain the importance of notifying the Network Operations Center (NOC) team about the planned PM activities. • Describe how to retrieve information regarding an alarm from concerned teams and then perform Root Cause Analysis (RCA) to arrive at a possible cause and solution. • Identify the reporting hierarchy and procedure for escalating faults/issues at site to the supervisor • Explain the importance of the usage and maintenance policy for power checking tools and mechanical equipment. 	<ul style="list-style-type: none"> • Demonstrate how to maintain logs after checking site up-time. • Perform proper steps to carry out physical and logical maintenance activities in accordance with the repair and maintenance guidelines of the company. • Employ appropriate monitoring, troubleshooting and rectification techniques for ICT equipment and nodes based on the alarms raised. • Demonstrate how to prepare and maintain reports for maintenance activities. • Implement necessary methods to prioritise alarm resolutions based on severity. • Demonstrate how to diagnose corrective maintenance needs of the ICT equipment and nodes using the console cable. • Perform the required steps to coordinate with the ICT Engineer and NOC to rectify faults in the functioning of the ICT equipment/nodes and then enter relevant data regarding rectification in checklists/reports. • Employ proper ways for creating reports and checklists in appropriate formats as instructed by the ICT Engineer and NOC.
Classroom Aids:	
Whiteboard and markers, chart paper and sketch pens, LCD Projector and Laptop for presentations	
Tools, Equipment and Other Requirements	
ICT nodes, applications (like Secure CRT, Hyper terminal), basic ICT equipment, Base Transceiver Station (BTS), nodeB, router, transmission equipment, power measurement devices/equipment, power checking tools and mechanical equipment	

Module 4: ICT Nodes Operations Optimization

Mapped to TEL/N6224 v1.0

Terminal Outcomes:

- Demonstrate proper techniques for maintenance of ICT site operations.
- Explain how to timely and appropriately respond to alarms raised at the site.
- Perform appropriate coordination techniques to assist site team for work plan development.

Duration: 32:00	Duration: 54:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the procedure for collecting relevant information on change requests from the Configuration Management team or the NOC team. • Explain how to identify criticality and timelines to prioritize changes. • Discuss the change management process with concerned teams and authorized personnel. • Identify the functionality and application of installed ICT equipment, tools and techniques for correct interpretation and prioritization of change requests. • Describe how to rectify faults and handle alarms as per the organizational SOP. • Discuss how to maintain records and implications of non-maintenance. 	<ul style="list-style-type: none"> • Demonstrate how to carry out changes in the ICT equipment/nodes at the site as per the received change request schedule, ensuring minimal disruptions in site operations. • Employ various techniques to check the alarms raised, their status and criticality for planning optimization activities at site. • Implement appropriate procedure to coordinate with the ICT Engineer to prepare work plan and identify dependencies as well as develop escalation matrix. • Demonstrate how to enter data in corrective maintenance checklists/reports in conjunction with the ICT Engineer and NOC.
Classroom Aids:	
Whiteboard and markers, chart paper and sketch pens, LCD Projector and Laptop for presentations	
Tools, Equipment and Other Requirements	
ICT nodes, applications (like Secure CRT, Hyper terminal), basic ICT equipment, Base Transceiver Station (BTS), nodeB, router, transmission equipment, power measurement devices/equipment, power checking tools and mechanical equipment	

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

Terminal Outcomes:

- Explain how to plan work effectively, implement safety practices and optimise use of resources.

Duration: 16:00	Duration: 24:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the recent skills and technologies prevalent in the telecom industry. • Discuss the commonly occurring problems with their causes and solutions. • State the importance of keeping the workplace clean, safe and tidy. • 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. • Discuss the importance of 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 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 color dustbins for different types of waste. • Discuss the common sources of pollution and ways to minimize it. 	<ul style="list-style-type: none"> • 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. • Demonstrate ways for efficient utilization of material and water.
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: Interact Effectively with Team Members and Customers Mapped to TEL/N9102 v1.0

Terminal Outcomes:

- Discuss how to communicate effectively and develop interpersonal skills
- Explain the importance of developing sensitivity towards differently abled people

Duration: 16:00	Duration: 24:00
<p>Theory – Key Learning Outcomes</p> <ul style="list-style-type: none"> • Discuss the importance of following the standard operating procedures of the company w.r.t priority, confidentiality and security. • Explain the standard procedure of communication and escalations of issues at the workplace. • Discuss the importance of timely rectification of issues. • State the importance of coordinating and resolving conflicts with the team members to achieve smooth workflow. • Discuss about the different types of disabilities with their respective issues. • 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. 	<p>Practical – Key Learning Outcomes</p> <ul style="list-style-type: none"> • Use different modes of communication as per requirement and need. • Prepare a sample report of the commonly occurring errors and their solutions. • Demonstrate the use of gender and PwD (Person with Disability) inclusive language. • Prepare a list of institutes and government schemes that help PwD in overcoming challenges. • Demonstrate the ideal behavior with a PwD in an organization.
Classroom Aids	
Whiteboard and Markers, Chart paper and sketch pens, LCD Projector and Laptop for presentations	
Tools, Equipment and Other Requirements	
Sample of escalation matrix, organisation structure	

Module 7: On-the-Job Training

Mapped to Information and Communication Technology (ICT) Technician

Mandatory Duration: 120:00	Recommended Duration: 00:00
Location: On-Site	
Terminal Outcomes	
<ol style="list-style-type: none"> 1. Place equipment racks as per the asset layout plan. 2. Perform upkeep of various equipment. 3. Plan the site layout as per organisation standards and formats. 4. Report emergency situations like system failure, fire, power failure etc. to the authorized personnel. 5. Maintain logs after checking site up-time. 6. Perform physical and logical maintenance activities in accordance with the repair and maintenance guidelines. 7. Monitor, troubleshoot and rectify ICT equipment and nodes as per requirements. 8. Create and maintain reports for maintenance activities. 9. Act upon alarm resolutions based on severity. 10. Diagnose corrective maintenance needs of the ICT equipment and nodes. 11. Synchronize with the ICT Engineer and NOC to rectify faults in the functioning of the ICT equipment/nodes. 12. Prepare reports and checklists in appropriate formats as instructed by the ICT Engineer and NOC. 13. Perform changes in the ICT equipment/nodes at the site. 14. Verify the action taken on the alarms raised as per their status and priority. 15. Interact with the ICT Engineer to prepare work plan and identify dependencies. 16. Record data in corrective maintenance checklists/reports in conjunction with the ICT Engineer and NOC. 	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate	Science/Telecom/ Electronics/IT and other relevant fields	1	Network Management	0	NA	Eligible for ToT Program

Trainer Certification	
Domain Certification	Platform Certification
Job Role: “Information and Communication Technology (ICT) Technician” “TEL/Q6206 v2.0”, 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 Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate	Science/Telecom/ Electronics/IT and other relevant fields	1	Network Management	0	NA	Eligible for ToA Program

Assessor Certification	
Domain Certification	Platform Certification
Job Role: “Information and Communication Technology (ICT) Technician” “TEL/Q6206 v2.0”, 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

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
SOP	Standard Operating Procedures
CRM	Customer Relationship Management
PR	Public Relations
SDH	Synchronous Digital Hierarchy
DWDM	Dense Wavelength Division Multiplexing
BTS	Base Transceiver Station
RCA	Root Cause Analysis
PwD	Persons with Disabilities
EB	Electricity Board
PPE	Personal Protective Equipment
NOC	Network Operating Centre
SLA	Service Level Agreement
PM	Preventive Maintenance
CM	Corrective Maintenance
NMS	Network Monitoring System