Model Curriculum

QP Name: Telecom Electrician (Advanced)

QP Code: TEL/Q4303

QP Version: 1.0

NSQF Level: 4

Model Curriculum Version: 1.0

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

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Training Parameters

Sector	Telecom
Sub-Sector	Passive Infrastructure
Occupation	Customer Service/ Passive Infrastructure
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7422.9900
Minimum Educational Qualification and Experience	12th grade Pass or Equivalent with 1 Year of experience in relevant field **OR** 11th grade pass with 1 year of experience in relevant field **OR** 10th grade pass with 2 year of experience in relevant field **OR** Completed 3-year diploma after 10th (in relevant field) **OR** Previous relevant Qualification of NSQF Level (3-Telecom Electrician (Basic)) with 3 Years of experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	NA
Next Review Date	31.01.2027
NSQC Approval Date	31.01.2024
QP Version	1.0
Model Curriculum Creation Date	31.01.2024
Model Curriculum Valid Up to Date	31.01.2027
Model Curriculum Version	1.0
Minimum Duration of the Course	450 hours
Maximum Duration of the Course	450 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 to:

- Describe the process of designing and installing electrical infrastructure, including grounding and bonding systems, transformers, switchgear, and power distribution units, while adhering to industry standards and safety codes.
- Analyze power quality issues, calculate power-related parameters, and use monitoring equipment to ensure stable power distribution.
- Install an inverter system by choosing the appropriate capacity, selecting compatible batteries, and following safety precautions, ensuring a reliable power supply.
- Monitor and maintain batteries, inverters, and generators, including cleaning terminals, applying anti-corrosion grease, and setting up battery monitoring systems for optimal performance.

Compulsory Modules

The table lists the modules, their duration and mode of delivery.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	**20:00**	**10:00**	**00:00**	**-**	**30:00**
Module 1: Introduction to the role of a Telecom Electrician	20:00	10:00	00:00	-	30:00
TEL/N4301: Install and Maintain Inverter and Battery Banks NOS Version-1.0 NSQF Level- 4	**10:00**	**20:00**	**00:00**	**-**	**30:00**
Module 2: Inverter and Battery Bank Installation and Maintenance Practices	10:00	20:00	00:00	-	30:00
TEL/N4302: Design and Install One-Phase and Three-Phase Electrical Systems at cell site NOS Version-1.0 NSQF Level- 4	**10:00**	**20:00**	**30:00**	-	**60:00**
Module 3: Electrical System Design and Installation for Telecom Cell Sites	10:00	20:00	30:00	-	60:00

TEL/N4303: Install, Maintain, and Troubleshoot Electrical Components NOS Version-1.0 NSQF Level- 4	**20:00**	**40:00**	**30:00**	**-**	**90:00**
Module 4: Electrical Components Installation, Maintenance, and Troubleshooting	20:00	40:00	30:00	-	90:00
TEL/N4304: Upgrade electrical systems to meet capacity and power quality requirements NOS Version-1.0 NSQF Level- 4	**10:00**	**50:00**	**30:00**	-	**90:00**
Module 5: Capacity and Power Quality Enhancement Strategies for Electrical Systems	10:00	50:00	30:00	-	90:00
TEL/N4305: Develop and implement telecom electrical standards NOS Version-1.0 NSQF Level- 4	**10:00**	**20:00**	**30:00**	-	**60:00**
Module 6: Establishing Electrical Standards	10:00	20:00	30:00	-	60:00
TEL/N9101: Organise Work and Resources as per Health and Safety Standards NOS Version-2.0 NSQF Level-3	**10:00**	**20:00**	**00:00**	-	**30:00**
Module 7: Process of organising work and resources as per health and Safety standards	10:00	20:00	00:00	-	30:00
DGT/VSQ/N0102: Employability Skills (60 Hours) NOS Version No. 1.0 NSQF Level- 2	**60:00**	**00:00**	**00:00**	-	**60:00**
Module 8: Employability Skills	60:00	00:00	00:00	-	60:00
Total Duration	**150:00**	**180:00**	**120:00**		**450:00**

Module Details

Module 1: Introduction to the role of a Telecom Electrician (Advanced)

Bridge Module

Terminal Outcomes:

- Discuss the job role of a Telecom Electrician (Advanced).
- Explain the scope of work for a Telecom Electrician (Advanced).

Duration: *20:00*	**Duration**: *10:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the size and scope of the Telecom industry and its sub-sectors. • Discuss the role and responsibilities of a Telecom Electrician (Advanced). • Identify various employment opportunities for a Telecom Electrician (Advanced). • 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 a Telecom Electrician (Advanced). • List the various daily, weekly, monthly operations/activities that take place at the site under a Telecom Electrician (Advanced).	• Role play based on case studies, outlining the scope, responsibilities, and challenges of a Telecom Electrician (Advanced). • Analyse the requirements for the course and prepare for the pre-requisites of the course.
Classroom Aids:	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
NA	

Module 2: Inverter and Battery Bank Installation and Maintenance Practices

Mapped to NOS: TEL/N4301, v1.0

Terminal Outcomes:

- Explain the importance of choosing an inverter with an appropriate capacity for specific needs.
- Describe the importance of adequate space around the inverter for proper airflow.
- Demonstrate the ability to choose an inverter with the appropriate capacity for a given scenario.
- Inspect the battery bank, inverter, and all connections for wear, damage, or corrosion.

Duration: *10:00*	**Duration**: *20:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of choosing an inverter with an appropriate capacity for specific needs. • Describe the significance of selecting compatible batteries for an inverter's output capacity. • Explain the safety precautions involved in turning off the main power supply before installation. • Discuss the environmental considerations for inverter placement. • Describe the importance of adequate space around the inverter for proper airflow. • Explain the difference between connecting batteries in series and parallel. • Describe the process of grounding an inverter as per local electrical codes. • Summarize the steps involved in connecting an inverter to a battery bank. • Explain the procedure for verifying the inverter's output voltage and frequency. • Discuss the importance of regular monitoring of battery voltage and state of charge.	• Safely install an inverter in a well-ventilated, secure location. • Connect batteries in series or parallel as per inverter voltage requirements. • Connect the inverter to the battery bank using provided cables while ensuring correct polarity. • Ground the inverter according to local electrical codes. • Power on the inverter and check for warning lights or alarms. • Verify that the inverter is providing the desired output voltage and frequency. • Connect electrical loads to the inverter's output terminals. • Inspect the battery bank, inverter, and all connections for wear, damage, or corrosion. • Tighten loose connections and replace damaged cables or connectors. • Monitor battery voltage and state of charge. • Clean battery terminals and apply anti-corrosion grease. • Set up and configure a battery monitoring system to track voltage,

• Explain the significance of battery maintenance practices such as cleaning terminals and applying anti-corrosion grease. • Demonstrate the ability to choose an inverter with the appropriate capacity for a given scenario. • Apply knowledge of battery compatibility to select suitable batteries for an inverter. • Safely turn off the main power supply as part of the installation process. • Identify a suitable location for inverter installation based on environmental factors. • Calculate and allocate adequate space around the inverter for proper airflow.	temperature, and other relevant parameters. • Develop a plan for battery replacement based on the manufacturer's recommended service. • Demonstrate safe practices to avoid short circuits, overloads, and mishandling.
Classroom Aids:	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Inverter, Compatible batteries, Safety signage and PPE, measuring tape, markers, screws, brackets, Battery bank, Inverter cables, Grounding tools and materials, Multimeter, Electronic Load Simulator, Inspection mirror, Flashlight, Magnifying glass, Screwdrivers, Pliers, Wrenches, Wire brush, Dielectric grease, Circuit breaker, Fuses	

Module 3: Electrical System Design and Installation for Telecom Cell Sites

Mapped to NOS: TEL/N4302, v1.0

Terminal Outcomes:

- Describe the process of managing NOC infrastructure and incidents.
- Demonstrate the process of tracking and analysing NOC incidents.

Duration: *10:00*	**Duration**: *20:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Identify the available power source and voltage levels in different telecom cell site locations. • Explain the significance of grounding and bonding systems in ensuring electrical safety and compliance with codes. • Apply knowledge of local regulations and utility requirements to obtain necessary permits and approvals for electrical installations. • Analyze equipment specifications and environmental conditions to ensure compliance with safety standards and suitability for outdoor use. • Develop a comprehensive understanding of surge protection and backup power systems to ensure uninterrupted service. • Assess the importance of proper labeling, signage, and equipment enclosure in maintaining safety at the cell site.	• Calculate the total electrical load requirements for a cell site and select the appropriate voltage level for a one-phase system. • Design and create a grounding and bonding system that meets safety and code requirements for a given cell site. • Install transformers, switchgear, distribution panels, and other electrical components following manufacturer guidelines and local codes. • Conduct continuity checks, insulation resistance tests, and functional tests on the electrical system using appropriate testing equipment. • Make secure and properly torqued electrical connections, and label all cables and conductors for easy identification. • Identify and correct voltage imbalances to ensure even power distribution and prevent fluctuations in a three-phase system. • Connect cell site equipment, including base stations, antennas, and power distribution units (PDUs), to the electrical system, ensuring proper grounding and secure connections. • Implement safety measures, such as installing safety labels and signage, to protect personnel working at the

	cell site. • Choose and size circuit breakers, fuses, and protective devices to ensure safe and reliable power distribution based on equipment requirements. • Create a single-line diagram outlining the electrical system's components, adhering to industry and regional standards.

Classroom Aids:
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films
Tools, Equipment and Other Requirements
Multimeter, Insulation resistance tester, Testing equipment for continuity checks, Torque wrench, Labeling tools, Surge protection devices, Transformers, Switchgear, Distribution panels, Safety labels and signage, Circuit breakers, Fuses

Module 4: Electrical Components Installation, Maintenance, and Troubleshooting

Mapped to NOS: TEL/N4303, v1.0

Terminal Outcomes:

- Define and list the essential tools and equipment required for telecom equipment installation and maintenance.
- Describe the process of conducting site surveys for generator placement.
- Participate in a lockout/tagout exercise to safely disconnect power sources.
- Inspect and analyze electrical components for signs of wear, damage, or corrosion.
- Develop a reliable fuel supply system, including fuel tanks, pipes, and safety mechanisms.

Duration: *20:00*	**Duration**: *40:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Define and list the essential tools and equipment required for telecom equipment installation and maintenance. • Explain the importance of following installation guidelines provided by telecom equipment manufacturers. • Describe the lockout/tagout procedures and their significance in ensuring safety during electrical work. • Explain the purpose of surge protectors and lightning arrestors in telecom systems. • Understand the critical steps involved in mounting and connecting antennas and radio equipment. • Comprehend the role of grounding systems in electrical safety. • Explain the significance of keeping electrical components clean and free of dust. • Describe the process of conducting site surveys for generator placement.	• Demonstrate the correct use of multimeters, insulation resistance testers, and cable testers in a hands-on environment. • Follow and apply installation guidelines provided by a telecom equipment manufacturer for specific equipment. • Participate in a lockout/tagout exercise to safely disconnect power sources. • Install power distribution equipment, backup power systems, and grounding systems in a controlled setting. • Practice mounting and connecting antennas and radio equipment following industry standards. • Install surge protectors and lightning arrestors on electrical systems. • Connect power supplies, HVAC systems, and data cabling as per telecom requirements. • Set up a network operations center with proper electrical wiring and infrastructure. • Inspect and analyze electrical components for signs of wear, damage, or corrosion.

	• Conduct a thorough site survey to determine generator placement and site-specific requirements. • Analyze power requirements and select an appropriate generator based on specified conditions. • Ensure compliance with local permits, regulations, and safety standards for generator installation. • Construct a stable concrete foundation for a generator. • Securely mount a generator to prevent vibrations and reduce noise in a controlled environment. • Develop a reliable fuel supply system, including fuel tanks, pipes, and safety mechanisms. • Connect a generator to a simulated telecom system's electrical panel, ensuring proper grounding and wiring. • Conduct initial start-up and load testing of a generator in a simulated telecom environment to ensure correct operation. • Perform routine visual inspections of the generator and identify issues, such as leaks or loose connections. • Monitor and assess the cooling system, including coolant levels and radiator cleanliness. • Analyze and interpret diagnostic tools and software provided by the generator manufacturer to identify issues. • Monitor and respond to generator alarms and warnings promptly in a training scenario. • Troubleshoot fuel delivery problems, such as clogs, leaks, or contaminated fuel, in a controlled environment.
Classroom Aids:	

Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films
Tools, Equipment and Other Requirements
Multimeters, Insulation Resistance Testers, Cable Testers, Lockout/Tagout Kits, Surge Protectors, Lightning Arrestors, Power Distribution Equipment, Backup Power Systems, Grounding Systems, Antennas and Radio Equipment, Generators, Measuring Tape, Screwdrivers, Bolts and Nuts, Mounting Brackets, Pipes (Fuel Lines), Fuel Pumps, Safety Valves, Digital Multimeter, Infrared Thermometer, Flashlights, Fuel Flow Meter

Module 5: Capacity and Power Quality Enhancement Strategies for Electrical Systems

Mapped to NOS: TEL/N4304, v1.0

Terminal Outcomes:

- Recall the fundamental principles of electrical infrastructure and power requirements in telecom systems.
- Apply electrical principles to calculate power-related parameters.
- Develop upgrade plans for electrical distribution systems, including the selection of appropriate components and installation coordination.

Duration: *10:00*	**Duration**: *50:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Recall the fundamental principles of electrical infrastructure and power requirements in telecom systems. • List common power quality issues, including voltage fluctuations, harmonics, and surges. • Explain the importance of balancing electrical loads in a telecom environment. • Describe the concept of power factor correction and its significance. • Apply knowledge of electrical diagrams and schematics to understand the wiring in telecom equipment. • Apply electrical principles to calculate power-related parameters. • Analyze power quality reports to identify areas for improvement in telecom equipment performance. • Analyze load requirements to determine the need for electrical infrastructure upgrades. • Evaluate the effectiveness of surge protection devices in safeguarding telecom systems from voltage spikes. • Assess the reliability of backup power systems and make recommendations for improvements.	• Use power quality monitoring equipment to collect data on voltage stability and harmonics. • Operate electrical testing instruments, such as multimeters and oscilloscopes, to assess the health of electrical circuits and components. • Recognize and troubleshoot common electrical faults, such as short circuits and ground faults. • Perform detailed electrical assessments for cell sites and telecom equipment to identify potential issues and capacity constraints. • Develop upgrade plans for electrical distribution systems, including the selection of appropriate components and installation coordination. • Generate comprehensive power quality reports to present findings and areas for improvement in telecom equipment performance. • Evaluate the effectiveness of voltage stabilizers and regulators in addressing voltage fluctuations. • Continuously monitor and maintain grounding systems for electrical safety. • Install surge protectors and lightning

	arrestors to safeguard telecom systems from voltage spikes and lightning strikes. • Implement routine electrical maintenance tasks, including cleaning, connection tightening, and lubrication. • Identify opportunities to improve energy efficiency in the electrical systems of telecom sites. • Troubleshoot and isolate electrical problems in telecom systems to minimize downtime. • Design electrical systems with scalability in mind to accommodate future growth and technology advancements.
Classroom Aids:	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Multimeters, Oscilloscopes, Power quality monitoring equipment, Surge protectors, Lightning arrestors, Voltage stabilizers, Regulators	

Module 6: Establishing Electrical Standards

Mapped to NOS: TEL/N4305, v1.0

Terminal Outcomes:

- Describe the types of electrical hazards and the importance of risk assessments in electrical protection.
- Summarize the key components of an effective protection system and how they work together.
- Apply troubleshooting skills to identify and resolve network issues promptly.
- Implement security measures, including firewalls and access controls, to protect a simulated network infrastructure.

Duration: *10:00*	**Duration**: *20:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the types of electrical hazards and the importance of risk assessments in electrical protection. • Explain the significance of staying updated with electrical codes and standards for safety in protection system design. • Define various protective devices such as circuit breakers, fuses, and relays and their application in electrical protection. • Explain the concept of redundancy in protection systems and its role in enhancing reliability. • Describe the purpose and components of an effective grounding and bonding system. • Summarize the key components of an effective protection system and how they work together. • Interpret the results of an arc flash hazard analysis and its implications on protection measures. • Explain the concept of protection zones in an electrical system and their role in safeguarding critical equipment. • Describe the functions of protective relays in detecting abnormal conditions and taking protective actions.	• Conduct a risk assessment for a specific electrical system and determine the level of protection required. • Choose and configure protective devices for fault isolation in a simulated electrical system. • Implement redundancy in a protection system and assess its impact on reliability. • Configure protective relays to detect and respond to abnormal conditions in a practical scenario. • Terminate network cables and connectors following industry standards and best practices. • Design a protection scheme for a given electrical system, dividing it into protection zones and selecting appropriate protective devices. • Develop a cable routing plan for a network installation, considering cable length, type, and management. • Implement security measures, including firewalls and access controls, to protect a simulated network infrastructure. • Perform a practical arc flash hazard analysis and design protective measures.

• Differentiate between various fault detection methods, including overcurrent, differential, and ground fault protection. • Apply knowledge of protection settings to configure protective devices for specific fault conditions. • Develop a protection scheme for a given electrical system, dividing it into protection zones and selecting appropriate protective devices. • Implement remote monitoring and control capabilities for a protection system. • Perform cable testing and certification to validate the functionality and compliance of installed cables. • Apply troubleshooting skills to identify and resolve network issues promptly. • Analyze the requirements of a network infrastructure and determine the appropriate networking hardware and cable routing plan. • Evaluate the results of protection system testing and commissioning to ensure proper operation. • Assess the impact of evolving technology on protection systems and recommend improvements. • Analyze network configurations to ensure optimal performance and security. • Evaluate the effectiveness of security measures in protecting the network infrastructure from cyber threats.	• Configure network devices to optimize network performance and security. • Test and commission a protection system to validate its proper operation under both normal and fault conditions. • Conduct practical troubleshooting exercises to identify and resolve network issues promptly. • Assess the functionality and compliance of installed cables through testing and certification. • Evaluate the effectiveness of security measures in protecting a simulated network from cyber threats. • Develop and implement a comprehensive emergency response plan for electrical faults in a practical scenario.
Classroom Aids:	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Multimeter, Insulation Resistance Tester, Cable Tester, Surge Protectors, Protective Relays, Circuit Breakers, Fuses, Firewalls, Access Controls	

Module 7: Process of organizing work and resources as per health and safety standards

Mapped to NOS: TEL/N9101, v2.0

Terminal Outcomes:

- Explain the importance of performing work as per quality standards.
- Explain the importance of maintaining a safe, healthy and secure working environment.
- Explain the importance of conserving material/energy/electricity.
- Describe the process of using effective waste management/recycling practices.

Duration: *10:00*	**Duration**: *20:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain various strategies pertinent to their field (such as internet searches, asking peers and managers, enrolling for courses and certifications, etc.) that can be used to pursue advancement in their skills. • State key performance indicators for the new tasks. • Describe feedback processes and formats. • Explain timelines and goals as well as their relevance to work allocated. • Explain the importance of quality and timely delivery of the product/service. • Explain the escalation matrix and its importance, especially in case of emergencies. • Explain various ways of time and cost management. • State the rules/regulations for maintaining health and safety at the workplace. • Explain the meaning of hazard, different types of health and safety hazards found in the workplace, risks and threats based on the nature of work. • Explain the relevant signage, warnings, labels or descriptions on equipment, etc. while carrying out work activities.	• Demonstrate how to record/document tasks completed as per the requirements within specific timelines. • Show how to analyse problems accurately and communicate different possible solutions to the problem. • Demonstrate how to report any identified breaches in health, safety, and security policies and procedures to the designated person. • Demonstrate the process of using safety materials such as goggles, gloves, earplugs, caps, ESD pins, covers, shoes, etc. • Demonstrate the process of handling heavy and hazardous materials with care, while maintaining appropriate posture. • Demonstrate the process of carrying out routine cleaning of tools, machines and equipment. • Demonstrate ways to optimise the use of electricity/energy in various tasks/activities/processes. • Demonstrate the process of performing periodic checks of the functioning of the equipment/machine and rectify wherever required. • Demonstrate ways to use electrical equipment and appliances properly

• Describe the procedures to report breaches in health, safety and security. • Describe the organisation's procedures for different emergency situations and the importance of following the same. • Describe different methods of cleaning, disinfection, sterilization, and sanitization. • Explain the significance of personal hygiene practice including hand hygiene. • Explain the path of disease transmission. • Describe the correct method of donning and doffing of PPE. • Explain different ways of managing resources and material efficiently. • Explain common electrical problems and common practices of conserving electricity. • Explain categorization of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics and use of different colours of dustbins. • Describe the organisation's procedures for minimizing waste. • Explain waste management and methods of waste disposal. • State common sources of pollution and ways to minimize it.	• Demonstrate the process of disposing non-recyclable and hazardous waste as per recommended processes.
Classroom Aids:	
Training Kit (Trainer **G**uide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Relevant stationery, First Aid Kit and Equipment used in Medical Emergencies.	

Module 8: Employability Skills

Mapped to NOS: DGT/VSQ/N0102

Mandatory Duration: 60:00			
Location: On-Site			
S.No.	**Module Name**	**Key Learning Outcomes**	**Duration(hours)**
1.	Introduction to Employability Skills	• Discuss the Employability Skills required for jobs in various industries • List different learning and employability related GOI and private portals and their usage	1.5 Hours
2.	Constitutional values - Citizenship	• Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen • Show how to practice different environmentally sustainable practices.	1.5 Hours
3.	Becoming a Professional in the 21st Century	• Discuss 21st century skills. • Display positive attitude, self - motivation, problem solving, time management skills and continuous learning mindset in different situations.	1 Hours
4.	Basic English Skills	• Use appropriate basic English sentences/phrases while speaking	2 Hours
5.	Communication Skills	• Demonstrate how to communicate in a well - mannered way with others. • Demonstrate working with others in a team	4 Hour
6.	Diversity & Inclusion	• Show how to conduct oneself appropriately with all genders and PwD • Discuss the significance of reporting sexual harassment issues in time	1 Hour
7.	Financial and Legal Literacy	• Discuss the significance of using financial products and services safely and securely. • Explain the importance of managing expenses, income, and savings. • Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws	4 Hours

8.	Essential Digital Skills	• Show how to operate digital devices and use the associated applications and features, safely and securely • Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely	3 Hours
9.	Entrepreneurship	• Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges	7 Hours
10.	Customer Service	• Differentiate between types of customers • Explain the significance of identifying customer needs and addressing them • Discuss the significance of maintaining hygiene and dressing appropriately	4 Hours
11.	Getting ready for apprenticeship & Jobs	• Create a biodata • Use various sources to search and apply for jobs • Discuss the significance of dressing up neatly and maintaining hygiene for an interview • Discuss how to search and register for apprenticeship opportunities	2 Hours

LIST OF TOOLS & EQUIPMENT FOR EMPLOYABILITY SKILLS

S. No.	**Name of the Equipment**	**Quantity**
1.	Computer (PC) with latest configurations – and Internet connection with standard operating system and standard word processor and worksheet software (Licensed) (all software should either be latest version or one/two version below)	As required
2.	UPS	As required
3.	Scanner cum Printer	As required
4.	Computer Tables	As required
5.	Computer Chairs	As required
6.	LCD Projector	As required
7.	White Board 1200mm x 900mm	As required

Note: Above Tools &Equipment not required, if Computer LAB is available in the institute.

Module 9: On-the-Job Training

Mapped to Telecom Electrician (Advanced)

Mandatory Duration: *120:00*	**Recommended Duration:** *00:00*
Module Name: On-the-Job Training **Location: On Site**	

Terminal Outcomes

1. Identify potential electrical hazards and conduct thorough risk assessments to determine the level of protection required.
2. Choose the right protective devices, such as circuit breakers, fuses, relays, and surge protectors, based on the specific needs of the electrical system and its components.
3. Configure protection settings, including current and voltage levels, time delays, and coordination with upstream and downstream devices to ensure proper fault isolation.
4. Incorporate redundancy in protection systems to enhance reliability and minimize downtime in case of a fault or failure.
5. Establish effective grounding and bonding systems to reduce the risk of electrical faults and protect against electrical shock hazards.
6. Configure protective relays to detect abnormal conditions and trip circuit breakers or initiate other protective actions when necessary.
7. Perform arc flash hazard analysis to assess the potential energy release in the event of a fault and design protective measures accordingly.
8. Thoroughly test and commission protection systems to validate their proper operation under normal and fault conditions.
9. Develop and implement a regular maintenance plan, including periodic testing and inspection of protective devices to ensure ongoing reliability.
10. Establish comprehensive emergency response plans to address electrical faults and coordinate actions to minimize downtime and safety risks.

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
3 yrs in Engg. Diploma after 10th class	Electrical/Electronics	5	Eligible for ToT program	0	NA	Eligible for ToT program
Graduate (B.E/B.Tech)	Electrical/Electronics	3	Eligible for ToT program	0	NA	Eligible for ToT program
3 yrs in Engg. Diploma after 10th class	Electrical/Electronics			10	Teaching Experience	
Graduate (B.E/B.Tech)	Electrical/Electronics			6	Teaching Experience	

Trainer Certification	
Domain Certification	**Platform Certification**
Job Role "**Telecom Electrician (Advanced)**", "TEL/Q4303, v1.0", Minimum accepted score is 80%.	Trainer is certified for the job role **"Trainer (VET & SKILLS)"**; mapped to Qualification Pack: - "MEP/Q2601, v2.0" with minimum 80% of score.

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	5	Eligible for ToT program	0	NA	Eligible for ToA program
Graduate	Science/Electronics/ Telecom/IT and other relevant domains	3	Eligible for ToT program	0	NA	Eligible for ToA program

Assessor Certification	
Domain Certification	**Platform Certification**
Job Role "**Telecom Electrician (Advanced)**", "TEL/Q4303, v1.0", Minimum accepted score is 80%	Assessor is certified for the job role **"Assessor (VET & SKILLS)"**; mapped to Qualification Pack: - "MEP/Q2701, v2.0" with minimum 80% of score.

Trainer Requirements (Employability Skills 60 hours)

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	**Specialization**	**Years**	**Specialization**	
Graduate/CITS	Any discipline			2	Teaching experience	Prospective ES trainer should: • have good communication skills • be well versed in English • have digital skills • have attention to detail • be adaptable • have willingness to learn
Current ITI trainers	Employability Skills Training (3 days full-time course done between 2019-2022) from Management SSC (MEPSC)					
Certified current EEE trainers (155 hours)						
Certified Trainer	Qualification Pack: Trainer					

Trainer Certification	
Domain Certification	**Platform Certification**
Certified in 30-hour Employability NOS (2022), with a minimum score of 80% OR Certified in 120- OR 90- OR 60-hour Employability NOS (2022), with a minimum score of 80%	NA

Master Trainer Requirements (Employability Skills 60 hours)

Master Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	**Specialization**	**Years**	**Specialization**	
Graduate/CITS	Any discipline			3	Employability Skills curriculum training experience with an interest to train as well as orient other peer trainers	Prospective ES trainer should: • have good communication skills • be well versed in English • have digital skills • have attention to detail • be adaptable • have willingness to learn
Certified Master Trainer	Qualification Pack: Master Trainer			3	EEE training of Management SSC (MEPSC) (155 hours)	

Master Trainer Certification	
Domain Certification	**Platform Certification**
Certified in 30-hour Employability NOS (2022), with a minimum score of 90%. OR Certified in 120- OR 90- OR 60-hour Employability NOS (2022), with a minimum score of 90%	NA

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.
   - The 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.
   - An assessor must be ToA certified & 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.
   - 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:
   - A surprise visit to the assessment location.
   - A 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.

Assessment Strategy (Employability Skills 60 hours)

The trainee will be tested for the acquired skill, knowledge and attitude through formative/summative assessment at the end of the course and as this NOS and MC is adopted across sectors and qualifications, the respective AB can conduct the assessments as per their requirements.

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	A key learning outcome is a 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	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
NOS	National Occupational Standard (s)
NSQF	National Skills Qualifications Framework
OJT	On-the-job Training
QP	Qualifications Pack
PwD	People with Disability
PPE	Personal Protective Equipment