Qualification Pack

Digital Connectivity Infrastructure (DCI) Designer

QP Code: ICE/TEL/Q0301

Version: 1.0

NSQF Level: 5.5

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Qualification Pack

ICE/TEL/Q0301: Digital Connectivity Infrastructure (DCI) Designer

Brief Job Description

A Digital Connectivity Infrastructure Designer specializes in integrating digital solutions into physical infrastructure to enable seamless communication and data transfer. They design structured cabling systems, wireless networks, and digital configurations that connect various components of the infrastructure. Their focus is on creating scalable, efficient, and reliable systems that support modern technological demands while ensuring robust connectivity across the entire infrastructure.

Personal Attributes

A Digital Connectivity Infrastructure Designer should possess strong analytical and problem-solving skills, coupled with meticulous attention to detail for designing efficient systems. Excellent communication and collaboration abilities are essential for effective teamwork and stakeholder engagement. They must also be adaptable, innovative, and committed to staying updated with evolving technologies and industry standards.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. ICE/TEL/N0301: Basics of Digital Connectivity Infrastructure (DCI)
2. ICE/TEL/N0302: Design Electrical Systems in Infrastructure
3. ICE/TEL/N0303: Design Information and Communication Technology Systems in Infrastructure
4. ICE/TEL/N0304: Digital Connectivity Equipment Management and Workplace Safety Practices
5. DGT/VSQ/N0102: Employability Skills (60 Hours)

Qualification Pack (QP) Parameters

Sector	Telecom
Sub-Sector	Digital Infrastructure
Occupation	Digital Connectivity Infrastructure
Country	India
NSQF Level	5.5

Qualification Pack

Credits	20
Aligned to NCO/ISCO/ISIC Code	NCO/2015-2153.9900/2153.0100/2153.0400
Minimum Educational Qualification & Experience	Completed 4 year UG program (Civil/Architecture/IT/ECE/Electrical) OR Completed 3 year diploma after 10th (Civil/Architecture/IT/ECE/Electrical) with 3 Years of experience OR Previous relevant Qualification of NSQF Level (5) with 1.5 years of experience Civil/Architecture/IT/ECE/Electrical
Minimum Level of Education for Training in School	Not Applicable
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	NA
Next Review Date	08/05/2028
NSQC Approval Date	08/05/2025
Version	1.0
Reference code on NQR	QG-5.5-TL-04295-2025-V1-ICES
NQR Version	1

Remarks:

NA

Qualification Pack

ICE/TEL/N0301: Basics of Digital Connectivity Infrastructure (DCI)

Description

This NOS unit covers the foundational technologies and systems that enable seamless data transmission within infrastructure, including structured cabling, networking devices, and wireless connectivity standards.

Scope

The scope covers the following :

- This unit focuses on equipping individuals with the knowledge and skills to:
- 1. Understand and apply principles of structured cabling, networking devices, and wireless technologies for seamless communication.
- 2. Design and implement reliable cabling and networking systems to ensure uninterrupted communication flow.
- 3. Identify and utilize appropriate hardware and protocols to facilitate efficient data exchange across various environments.
- 4. Comprehend the core responsibilities and functions of a DCI Designer.

Elements and Performance Criteria

Roles and Responsibilities of a DCI Designer

To be competent, the user/individual on the job must be able to:

PC1. Explain DCI framework principles and essential components.

PC2. Describe key responsibilities of a DCI Designer.

PC3. Identify career opportunities for a DCI Designer.

Understand the Elements of Active and Passive Infrastructure

To be competent, the user/individual on the job must be able to:

PC4. Analyze active and passive network component roles and interactions for seamless communication, adhering to industry standards

PC5. Configure active network devices (routers, switches) for desired connectivity.

PC6. Terminate and test passive network components (cables, connectors) for proper data transmission.

PC7. Integrate active components with existing passive infrastructure for cohesive systems.

Prior Processing for DCI

To be competent, the user/individual on the job must be able to:

PC8. Assess physical environments to optimize equipment placement and cable routing, creating detailed floor plans.

PC9. Develop network topology diagrams, select cabling types, and estimate quantities according to standards.

PC10. Verify component quality and pre-configure network equipment before installation, labeling cables for efficiency.

PC11. Apply cable cutting, labeling, and RJ45 crimping practices, then test cables for continuity.

PC12. Implement redundancy and failover mechanisms, configuring initial settings for all network devices.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Foundational principles and structure of the DCI framework.
KU2. Significance of the role and duties of a DCI Designer.
KU3. Professional pathways and job prospects for a DCI Designer.
KU4. Functions of active infrastructure components like routers, switches, and access points in signal processing and network management.
KU5. Role of passive infrastructure components such as cables, patch panels, and connectors in data transmission.
KU6. Interaction between active and passive components in ensuring smooth network communication.
KU7. Industry standards and protocols for installing active and passive infrastructure.
KU8. Importance of environmental factors, including airflow and temperature, in maintaining equipment durability.
KU9. Preparatory steps required for establishing a robust digital connectivity infrastructure.
KU10. Importance of planning for scalability, reliability, and compliance with industry standards.
KU11. How to evaluate the physical environment, considering factors like size, layout, ventilation, and power supply, for connectivity installation.
KU12. Process of identifying optimal locations for placing equipment like routers, switches, and access points.
KU13. Role of network topology diagrams in visualizing device connectivity.
KU14. Selection of appropriate cabling, such as Ethernet and fiber optics, and routing paths.
KU15. Significance of redundancy and failover mechanisms in ensuring uninterrupted connectivity.
KU16. Need to adhere to TIA/EIA and ISO/IEC standards for cabling and connectivity systems.
KU17. Methods to estimate the required quantities of cables, connectors, and hardware.
KU18. Procedures for verifying the quality of cables, connectors, and hardware components.
KU19. Steps involved in pre-configuring equipment like routers and switches before deployment.

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. Listen and communicate effectively and accurately.
GS2. Apply problem-solving approaches for different situations.
GS3. Work effectively in a team.
GS4. Employ proper time management.
GS5. Plan and organize work.
GS6. Maintain hygiene and sanitation.

GS7. Demonstrate analytical skills.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Roles and Responsibilities of a DCI Designer	**14**	**17**	**-**	**4**
PC1. Explain DCI framework principles and essential components.	-	-	-	-
PC2. Describe key responsibilities of a DCI Designer.	-	-	-	-
PC3. Identify career opportunities for a DCI Designer.	-	-	-	-
Understand the Elements of Active and Passive Infrastructure	**13**	**17**	**-**	**3**
PC4. Analyze active and passive network component roles and interactions for seamless communication, adhering to industry standards	-	-	-	-
PC5. Configure active network devices (routers, switches) for desired connectivity.	-	-	-	-
PC6. Terminate and test passive network components (cables, connectors) for proper data transmission.	-	-	-	-
PC7. Integrate active components with existing passive infrastructure for cohesive systems.	-	-	-	-
Prior Processing for DCI	**13**	**16**	**-**	**3**
PC8. Assess physical environments to optimize equipment placement and cable routing, creating detailed floor plans.	-	-	-	-
PC9. Develop network topology diagrams, select cabling types, and estimate quantities according to standards.	-	-	-	-
PC10. Verify component quality and pre-configure network equipment before installation, labeling cables for efficiency.	-	-	-	-
PC11. Apply cable cutting, labeling, and RJ45 crimping practices, then test cables for continuity.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. Implement redundancy and failover mechanisms, configuring initial settings for all network devices.	-	-	-	-
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ICE/TEL/N0301
NOS Name	Basics of Digital Connectivity Infrastructure (DCI)
Sector	Telecom
Sub-Sector	
Occupation	Digital Connectivity Infrastructure
NSQF Level	5.5
Credits	1
Version	1.0
Last Reviewed Date	08/05/2025
Next Review Date	08/05/2028
NSQC Clearance Date	08/05/2025

ICE/TEL/N0302: Design Electrical Systems in Infrastructure

Description

This NOS unit covers the design of safe, efficient, and reliable power distribution networks to support diverse operational needs within infrastructure, ensuring adherence to industry standards and regulations.

Scope

The scope covers the following :

- This unit focuses on equipping individuals with the knowledge and skills to:
- Ensure the design of electrical systems supports safety, efficiency, and reliability in infrastructure projects.
- Incorporate compliance with industry standards and regulations for effective power distribution.

Elements and Performance Criteria

Electrical Conventional Drawing Symbols and General Requirements in Infrastructure

To be competent, the user/individual on the job must be able to:

PC1. Interpret standard electrical symbols and locate components on blueprints, illustrating connections. (Apply, Understand)

PC2. Design electrical circuits with correct symbols, dimensions, and annotations, drafting wiring plans for various infrastructure types, ensuring code compliance. (Create, Apply)

PC3. Apply fundamental electrical principles (e.g., load calculations, grounding, circuit protection) throughout design, ensuring safety. (Apply)

PC4. Create comprehensive electrical system drawings using manual or software tools, establishing documentation processes. (Apply, Create)

PC5. Verify electrical drawing integration into installations by ensuring proper component placement and marking layouts on-site. (Evaluate, Apply)

Electrical Installation Planning in Infrastructure

To be competent, the user/individual on the job must be able to:

PC6. Assess power requirements and infrastructure constraints, designing optimized electrical layouts and planning safe routing for components.

PC7. Select appropriate electrical components based on load calculations and environmental factors, implementing energy-efficient strategies and integrating renewables.

PC8. Design and implement earthing, grounding, and bonding systems, ensuring correct application of protective devices and circuit separation.

PC9. Install wiring, conduits, and fixtures according to plans and standards, performing accurate terminations.

PC10. Develop detailed electrical installation plans adhering to codes, and conduct thorough tests to verify system performance and safety

Distribution of Cabling and Supply in Infrastructure

To be competent, the user/individual on the job must be able to:

PC11. Select appropriate cable sizes and types, accurately calculating capacity and losses, and planning cable routes considering segregation and bending radius.

PC12. Design efficient power distribution feeder systems with load balancing, selecting appropriate cable management systems and distribution components.

PC13. Ensure proper earthing and protection for distributed cables, installing circuit breakers and adhering to safety codes.

PC14. Mount and connect distribution boards and feeders, ensuring accurate cable labeling and termination.

PC15. Conduct tests (continuity, insulation resistance, voltage drop) to verify system performance, identify faults, and rectify installation errors.

Electrical Wiring, Accessories, Fittings, and Earthing System in Infrastructure

To be competent, the user/individual on the job must be able to:

PC16. Install various wiring systems (conduit, trunking), performing accurate cable routing, laying, and securing.

PC17. Install switches, sockets, holders, and other electrical fittings according to layout plans, ensuring proper mounting and alignment.

PC18. Set up earthing systems, including electrode installation and connections, measuring earth resistance and verifying connections.

PC19. Select and install protective devices (fuses, MCBs, RCCBs, surge arresters), adhering to codes and safety principles.

PC20. Identify and rectify faults in wiring and fittings to ensure system integrity and functionality.

Capacities and Area Requirement in Power Infrastructure

To be competent, the user/individual on the job must be able to:

PC21. Calculate system capacity based on load demand and expansion, considering voltage, efficiency, and power factor, relating ratings to building loads.

PC22. Size generators based on total electrical load and starting demands, selecting appropriate types and applying UPS sizing concepts for critical loads.

PC23. Explain the function of key power system components like circuit breakers, busbars, relays, and switchgear.

PC24. Install and commission generators, integrating cooling and fuel systems, and conducting operational tests.

PC25. Check voltage, load capacity, and efficiency, conducting insulation, dielectric strength, and functional tests for protective devices.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Types of electrical drawings (e.g., schematic, wiring, and layout diagrams) and their applications in residential, commercial, and industrial infrastructure.

KU2. Electrical codes and standards (e.g., NEC, IEC) and how to apply them in the creation, review, and verification of electrical designs.

KU3. How electrical systems are integrated into infrastructure, with attention to efficient space planning and correct component placement.

KU4. Importance of grounding, earthing, circuit protection, and load balancing in electrical system design to ensure safety and reliability.

KU5. Process of maintaining electrical documentation, including as-built drawings, revision logs, and the use of user manuals or software tools for system design and updates.

KU6. Requirements and principles of electrical installations in residential, commercial, and industrial infrastructure, including grounding, bonding, and protection principles.

KU7. Types and roles of electrical components such as switchboards, distribution panels, transformers, protective devices, and wiring systems.

KU8. Importance of adhering to codes (e.g., NEC, IEC) and zoning classifications for hazardous areas to ensure safety, quality, and compliance.

KU9. Process of testing protective devices (e.g., circuit breakers, surge protection) and electrical systems to verify their performance and safety.

KU10. Strategies for energy-efficient electrical installations, including proper wiring techniques, the use of LED lighting, and integration of renewable energy systems into designs.

KU11. Purpose and classification of cabling systems, including power cables, control cables, communication cables, and fiber optics, based on insulation, voltage levels, and applications (e.g., LV, MV, HV cables).

KU12. Principles of single-phase and three-phase supply systems, load balancing, feeder systems (radial, ring, interconnected), and their role in efficient power distribution.

KU13. Cabling safety codes and standards, principles of cable routing, bending radius, voltage drop calculations, and segregation techniques for power and data cables.

KU14. Purpose and use of cable trays, ducts, conduits, trunking systems, junction boxes, distribution boards, terminal blocks, and labeling systems for organized installations.

KU15. Methods to calculate current-carrying capacity, power losses in cables, and the use of testing tools to identify faults and verify installation quality, ensuring energy-efficient and safe cabling systems.

KU16. Various types of wiring systems including cleat, casing and capping, batten, and conduit wiring (surface and concealed).

KU17. Different electrical accessories such as switches, sockets, plugs, holders, junction boxes, fuse holders, and lighting components like lamp holders, reflectors, and diffusers.

KU18. Types of conduits (PVC, metal, flexible) and their respective applications in electrical installations.

KU19. Techniques involved in conduit installation, including cutting, bending, threading, and joining of conduit pipes.

KU20. How to secure conduits to walls, ceilings, or floors using clamps and brackets, and explain proper cable routing, laying, and securing methods in conduits or trays.

KU21. Importance and principles of earthing systems in preventing electric shocks, overloads, and fault conditions.

KU22. Different types of earthing systems (TT, TN-S, TN-C, IT), the concept of soil resistivity and its impact on earthing effectiveness, and the role of protective devices such as fuses, MCBs, RCCBs, and surge arresters in ensuring safety and system reliability.

KU23. Local and international standards (e.g., NEC, IEC) for wiring, accessories, fittings, and earthing.

KU24. Safe and code-compliant installation practices, including the proper mounting and alignment of electrical accessories, adherence to layout plans, and preparation for audits and inspections.

KU25. How to install different types of wiring systems, trunking, switches, sockets, and fittings.

KU26. How to set up earthing systems, install electrodes, and connect them to the main earthing bar.

KU27. Testing procedures such as earth resistance measurement, continuity tests, insulation resistance tests, and identifies and rectifies faults in wiring and electrical fittings using appropriate tools and techniques.

KU28. Basic factors influencing load demand, voltage levels, efficiency, and power factor.

KU29. Components circuit breakers, busbars, protection relays, and switchgear, and understand the different types of substations (distribution, transmission, step-up / step-down).

KU30. How to calculate capacities based on maximum load demand, future expansion, load diversity, and redundancy factors for reliability.

KU31. Different types of generators (diesel, gas, hybrid) and their applications, along with the impact of power factor and load diversity in generator sizing and selection.

KU32. Space, area, and safety requirements for substations, including fireproofing, clearance distances, and site planning to ensure accessibility and compliance with regulations.

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. Listen and communicate effectively and accurately.

GS2. Apply problem-solving approaches for different situations.

GS3. Work effectively in a team.

GS4. Employ proper time management.

GS5. Plan and organize work.

GS6. Maintain hygiene and sanitation.

GS7. Demonstrate analytical skills.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Electrical Conventional Drawing Symbols and General Requirements in Infrastructure	**8**	**10**	**-**	**2**
PC1. Interpret standard electrical symbols and locate components on blueprints, illustrating connections. (Apply, Understand)	-	-	-	-
PC2. Design electrical circuits with correct symbols, dimensions, and annotations, drafting wiring plans for various infrastructure types, ensuring code compliance. (Create, Apply)	-	-	-	-
PC3. Apply fundamental electrical principles (e.g., load calculations, grounding, circuit protection) throughout design, ensuring safety. (Apply)	-	-	-	-
PC4. Create comprehensive electrical system drawings using manual or software tools, establishing documentation processes. (Apply, Create)	-	-	-	-
PC5. Verify electrical drawing integration into installations by ensuring proper component placement and marking layouts on-site. (Evaluate, Apply)	-	-	-	-
Electrical Installation Planning in Infrastructure	**8**	**10**	**-**	**2**
PC6. Assess power requirements and infrastructure constraints, designing optimized electrical layouts and planning safe routing for components.	-	-	-	-
PC7. Select appropriate electrical components based on load calculations and environmental factors, implementing energy-efficient strategies and integrating renewables.	-	-	-	-
PC8. Design and implement earthing, grounding, and bonding systems, ensuring correct application of protective devices and circuit separation.	-	-	-	-
PC9. Install wiring, conduits, and fixtures according to plans and standards, performing accurate terminations.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. Develop detailed electrical installation plans adhering to codes, and conduct thorough tests to verify system performance and safety	-	-	-	-
Distribution of Cabling and Supply in Infrastructure	**8**	**10**	**-**	**2**
PC11. Select appropriate cable sizes and types, accurately calculating capacity and losses, and planning cable routes considering segregation and bending radius.	-	-	-	-
PC12. Design efficient power distribution feeder systems with load balancing, selecting appropriate cable management systems and distribution components.	-	-	-	-
PC13. Ensure proper earthing and protection for distributed cables, installing circuit breakers and adhering to safety codes.	-	-	-	-
PC14. Mount and connect distribution boards and feeders, ensuring accurate cable labeling and termination.	-	-	-	-
PC15. Conduct tests (continuity, insulation resistance, voltage drop) to verify system performance, identify faults, and rectify installation errors.	-	-	-	-
Electrical Wiring, Accessories, Fittings, and Earthing System in Infrastructure	**8**	**10**	**-**	**2**
PC16. Install various wiring systems (conduit, trunking), performing accurate cable routing, laying, and securing.	-	-	-	-
PC17. Install switches, sockets, holders, and other electrical fittings according to layout plans, ensuring proper mounting and alignment.	-	-	-	-
PC18. Set up earthing systems, including electrode installation and connections, measuring earth resistance and verifying connections.	-	-	-	-
PC19. Select and install protective devices (fuses, MCBs, RCCBs, surge arresters), adhering to codes and safety principles.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. Identify and rectify faults in wiring and fittings to ensure system integrity and functionality.	-	-	-	-
Capacities and Area Requirement in Power Infrastructure	**8**	**10**	**-**	**2**
PC21. Calculate system capacity based on load demand and expansion, considering voltage, efficiency, and power factor, relating ratings to building loads.	-	-	-	-
PC22. Size generators based on total electrical load and starting demands, selecting appropriate types and applying UPS sizing concepts for critical loads.	-	-	-	-
PC23. Explain the function of key power system components like circuit breakers, busbars, relays, and switchgear.	-	-	-	-
PC24. Install and commission generators, integrating cooling and fuel systems, and conducting operational tests.	-	-	-	-
PC25. Check voltage, load capacity, and efficiency, conducting insulation, dielectric strength, and functional tests for protective devices.	-	-	-	-
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ICE/TEL/N0302
NOS Name	Design Electrical Systems in Infrastructure
Sector	Telecom
Sub-Sector	
Occupation	Digital Connectivity Infrastructure
NSQF Level	5.5
Credits	5
Version	1.0
Last Reviewed Date	08/05/2025
Next Review Date	08/05/2028
NSQC Clearance Date	08/05/2025

ICE/TEL/N0303: Design Information and Communication Technology Systems in Infrastructure

Description

This NOS unit covers the planning and implementation of effective communication systems within infrastructure, including networking, data management, and connectivity, to ensure smooth operation and integration of all infrastructure components.

Scope

The scope covers the following :

- This unit focuses on equipping individuals with the knowledge and skills to:
- Plan and implement robust communication networks, ensuring data transfer and connectivity across infrastructure.
- Design information systems for efficient management and integration of various infrastructure components.

Elements and Performance Criteria

Basic Terminologies of Information and Communication Technology in Infrastructure

To be competent, the user/individual on the job must be able to:

PC1. Set up and configure essential IT equipment (computers, servers, routers), including basic LAN/WAN and Wi-Fi networks, applying fundamental security protocols.

PC2. Manage data within IT systems (storage, databases, cloud services), illustrating simple backups and utilizing cloud for recovery, understanding data redundancy.

PC3. Set up communication systems for voice, video, and data, understanding bandwidth and transmission over wired and wireless media, differentiating routers/switches.

PC4. Install and configure operating systems and essential software applications on IT equipment.

PC5. Utilize ICT tools (BAS, smart meters, IoT) to monitor infrastructure systems, diagnosing and resolving common IT issues.

Telecommunication Spaces and Connecting Hardware Requirements in Infrastructure

To be competent, the user/individual on the job must be able to:

PC6. Design telecommunication space layouts, ensuring proper allocation for hardware and cables, meeting building codes and safety standards.

PC7. Design and install structured cabling systems (copper and fiber optic) within telecommunication spaces, selecting appropriate cable management and performing accurate termination/testing.

PC8. Install and configure diverse telecommunication hardware (routers, switches, patch panels, servers) within designated spaces, ensuring proper labeling and grounding

PC9. Integrate essential power, environmental controls, and fire safety measures into telecommunication spaces, demonstrating integration with other infrastructure systems.

PC10. Diagnose and resolve common issues within telecommunication spaces (e.g., miswiring, signal loss) to ensure operational integrity.

Requirements of Connectors and Connecting Hardware and Telecommunication Spaces in Infrastructure

To be competent, the user/individual on the job must be able to:

PC11. Terminate copper and coaxial connectors onto cables following wiring schemes and crimping techniques, verifying integrity using testers.

PC12. Terminate fiber optic connectors, demonstrating proper techniques, and verify connections using optical power meters and OTDR.

PC13. Install patch panels, media converters, and server racks in telecommunication rooms, ensuring proper routing, secure connections, and grounding.

PC14. Implement cable management systems (trays, racks, conduits) to organize and protect cables, ensuring airflow and equipment spacing.

PC15. Diagnose and resolve connectivity failures and poor signal quality in copper and fiber networks, using performance tools to monitor.

Requirements and Applications of Cabling Infrastructure

To be competent, the user/individual on the job must be able to:

PC16. Determine appropriate cable types and lengths based on application factors, explaining their roles, and designing for capacity, signal integrity, and redundancy.

PC17. Install various cable types (UTP/STP, fiber optic, coaxial) and terminate with appropriate connectors, implementing cable management and redundancy.

PC18. Perform accurate copper and fiber optic terminations (e.g., RJ45, SC/LC, BNC/F-type), including cleaving and polishing for fiber.

PC19. Test installed cabling systems using appropriate tools (cable testers, optical power meters, OTDR) to verify connectivity and assess signal loss.

PC20. Identify common cabling issues (signal loss, faults, damage) using testing equipment and diagnose and correct them for optimal network performance.

Classification of Cables based on Fire Safety Properties in Infrastructure

To be competent, the user/individual on the job must be able to:

PC21. Choose appropriate cable types (e.g., FR, FRR, LSZH, flame-resistant) based on application and fire safety needs, assessing environmental requirements.

PC22. Explain how cables mitigate fire risks by limiting flame spread, maintaining circuit integrity, and producing minimal smoke/halogen gases (LSZH).

PC23. Apply national and international regulatory standards for fire-safe cable installations.

PC24. Install fire-resistant/retardant cables in building systems (e.g., emergency lighting, fire alarms) according to standards and codes.

PC25. Conduct cable fire-safety tests (e.g., Vertical Flame, Smoke Density, Glow Wire) using appropriate equipment.

Satellite Communications (SATCOM) for Infrastructure

To be competent, the user/individual on the job must be able to:

PC26. Design and configure basic SATCOM links for specific infrastructure needs, analyzing link budgets and evaluating satellite orbits.

PC27. Implement SATCOM system parameters (power levels, modulation) to meet performance objectives, applying knowledge of frequency bands and network architectures.

PC28. Perform antenna alignment, signal testing, and troubleshooting for SATCOM systems, including ground station setup and terrestrial network integration.

PC29. Adhere to regulatory frameworks and licensing requirements, implementing cybersecurity measures for SATCOM links.

PC30. Analyze the role of SATCOM in modern infrastructure, evaluating the suitability of different satellite orbits (GEO, MEO, LEO) for various use cases.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Role of ICT in infrastructure such as BMS, IoT, smart grids for communication, data management, and efficiency.

KU2. Networking components like routers, switches, LAN, and WAN form the backbone for data transfer in infrastructure systems.

KU3. Protocols such as TCP/IP, HTTP, and FTP ensure reliable, standardized, and secure communication across networks.

KU4. Data management covers types of data, storage methods, databases, and cloud services for backup and accessibility.

KU5. Telecom services include voice, data, and video, transmitted through wired and wireless media for seamless communication.

KU6. ICT enables monitoring of HVAC, electrical grids, and smart meters, improving energy efficiency and operational control.

KU7. Different cabling types like UTP, STP, coaxial, and fiber optic, are selected based on application and performance needs.

KU8. Cabling design considers distance, data rates, environment, capacity planning, and redundancy for reliable systems.

KU9. Standards such as ANSI/TIA and ISO/IEC guide cabling design, installation, and testing to ensure compliance and quality.

KU10. Connectors like copper, fiber optic, and coaxial link devices and networks for signal transmission.

KU11. Hardware such as patch panels, media converters, and distribution frames organize and manage network connectivity.

KU12. Proper termination techniques such as fiber splicing, crimping, and use of tools that ensure durable and efficient connections.

KU13. Testing with cable testers, OTDRs, and troubleshooting methods verifies signal integrity and resolves connectivity issues.

KU14. Fire-safety cables (FR, FRR, LSZH) are critical in high-occupancy and sensitive areas to maintain circuit integrity during fire.

KU15. SATCOM supports infrastructure via GEO, MEO, and LEO satellites, enabling global coverage, signal propagation, and integration with terrestrial networks.

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. GS1 Listen and communicate effectively and accurately.

GS2. GS2 Apply problem-solving approaches for different situations.
GS3. GS3 Work effectively in a team.
GS4. GS4 Employ proper time management.
GS5. GS5 Plan and organize work.
GS6. GS6 Maintain hygiene and sanitation.
GS7. GS7 Analytical skills.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Basic Terminologies of Information and Communication Technology in Infrastructure	**6**	**8**	**-**	**1**
PC1. Set up and configure essential IT equipment (computers, servers, routers), including basic LAN/WAN and Wi-Fi networks, applying fundamental security protocols.	-	-	-	-
PC2. Manage data within IT systems (storage, databases, cloud services), illustrating simple backups and utilizing cloud for recovery, understanding data redundancy.	-	-	-	-
PC3. Set up communication systems for voice, video, and data, understanding bandwidth and transmission over wired and wireless media, differentiating routers/switches.	-	-	-	-
PC4. Install and configure operating systems and essential software applications on IT equipment.	-	-	-	-
PC5. Utilize ICT tools (BAS, smart meters, IoT) to monitor infrastructure systems, diagnosing and resolving common IT issues.	-	-	-	-
Telecommunication Spaces and Connecting Hardware Requirements in Infrastructure	**7**	**9**	**-**	**2**
PC6. Design telecommunication space layouts, ensuring proper allocation for hardware and cables, meeting building codes and safety standards.	-	-	-	-
PC7. Design and install structured cabling systems (copper and fiber optic) within telecommunication spaces, selecting appropriate cable management and performing accurate termination/testing.	-	-	-	-
PC8. Install and configure diverse telecommunication hardware (routers, switches, patch panels, servers) within designated spaces, ensuring proper labeling and grounding	-	-	-	-
PC9. Integrate essential power, environmental controls, and fire safety measures into telecommunication spaces, demonstrating integration with other infrastructure systems.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. Diagnose and resolve common issues within telecommunication spaces (e.g., miswiring, signal loss) to ensure operational integrity.	-	-	-	-
Requirements of Connectors and Connecting Hardware and Telecommunication Spaces in Infrastructure	**7**	**8**	**-**	**2**
PC11. Terminate copper and coaxial connectors onto cables following wiring schemes and crimping techniques, verifying integrity using testers.	-	-	-	-
PC12. Terminate fiber optic connectors, demonstrating proper techniques, and verify connections using optical power meters and OTDR.	-	-	-	-
PC13. Install patch panels, media converters, and server racks in telecommunication rooms, ensuring proper routing, secure connections, and grounding.	-	-	-	-
PC14. Implement cable management systems (trays, racks, conduits) to organize and protect cables, ensuring airflow and equipment spacing.	-	-	-	-
PC15. Diagnose and resolve connectivity failures and poor signal quality in copper and fiber networks, using performance tools to monitor.	-	-	-	-
Requirements and Applications of Cabling Infrastructure	**6**	**8**	**-**	**2**
PC16. Determine appropriate cable types and lengths based on application factors, explaining their roles, and designing for capacity, signal integrity, and redundancy.	-	-	-	-
PC17. Install various cable types (UTP/STP, fiber optic, coaxial) and terminate with appropriate connectors, implementing cable management and redundancy.	-	-	-	-
PC18. Perform accurate copper and fiber optic terminations (e.g., RJ45, SC/LC, BNC/F-type), including cleaving and polishing for fiber.	-	-	-	-
PC19. Test installed cabling systems using appropriate tools (cable testers, optical power meters, OTDR) to verify connectivity and assess signal loss.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. Identify common cabling issues (signal loss, faults, damage) using testing equipment and diagnose and correct them for optimal network performance.	-	-	-	-
Classification of Cables based on Fire Safety Properties in Infrastructure	**7**	**9**	**-**	**2**
PC21. Choose appropriate cable types (e.g., FR, FRR, LSZH, flame-resistant) based on application and fire safety needs, assessing environmental requirements.	-	-	-	-
PC22. Explain how cables mitigate fire risks by limiting flame spread, maintaining circuit integrity, and producing minimal smoke/halogen gases (LSZH).	-	-	-	-
PC23. Apply national and international regulatory standards for fire-safe cable installations.	-	-	-	-
PC24. Install fire-resistant/retardant cables in building systems (e.g., emergency lighting, fire alarms) according to standards and codes.	-	-	-	-
PC25. Conduct cable fire-safety tests (e.g., Vertical Flame, Smoke Density, Glow Wire) using appropriate equipment.	-	-	-	-
Satellite Communications (SATCOM) for Infrastructure	**7**	**8**	**-**	**1**
PC26. Design and configure basic SATCOM links for specific infrastructure needs, analyzing link budgets and evaluating satellite orbits.	-	-	-	-
PC27. Implement SATCOM system parameters (power levels, modulation) to meet performance objectives, applying knowledge of frequency bands and network architectures.	-	-	-	-
PC28. Perform antenna alignment, signal testing, and troubleshooting for SATCOM systems, including ground station setup and terrestrial network integration.	-	-	-	-
PC29. Adhere to regulatory frameworks and licensing requirements, implementing cybersecurity measures for SATCOM links.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC30. Analyze the role of SATCOM in modern infrastructure, evaluating the suitability of different satellite orbits (GEO, MEO, LEO) for various use cases.	-	-	-	-
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ICE/TEL/N0303
NOS Name	Design Information and Communication Technology Systems in Infrastructure
Sector	Telecom
Sub-Sector	
Occupation	Digital Connectivity Infrastructure
NSQF Level	5.5
Credits	7
Version	1.0
Last Reviewed Date	08/05/2025
Next Review Date	08/05/2028
NSQC Clearance Date	08/05/2025

ICE/TEL/N0304: Digital Connectivity Equipment Management and Workplace Safety Practices

Description

This NOS unit covers effective management of digital connectivity equipment and ensures adherence to workplace safety standards. It emphasizes the correct handling, maintenance, and safety protocols for a secure and efficient digital infrastructure environment.

Scope

The scope covers the following :

- This unit focuses on equipping individuals with the knowledge and skills to:
- Understand and apply principles for the installation, operation, and maintenance of digital connectivity equipment.
- Implement workplace safety practices to prevent hazards and ensure compliance.

Elements and Performance Criteria

Understand the Industry Standards and Specifications for Digital Connectivity Equipment in Infrastructure

To be competent, the user/individual on the job must be able to:

PC1. Select appropriate digital connectivity equipment and cabling based on infrastructure requirements, considering factors like bandwidth, latency, scalability, and cost.

PC2. Install and configure digital connectivity devices and cabling according to industry standards, optimizing network performance with correct IP addressing, VLANs, and routing.

PC3. Apply relevant telecommunication standards (e.g., Structured Cabling, TIA/EIA) and LAN technologies (e.g., Ethernet, Wi-Fi, PoE) for network installation and cabling.

PC4. Test network speed, bandwidth, and reliability using appropriate tools to ensure performance standards are met.

PC5. Diagnose and resolve network connectivity issues (e.g., signal loss, latency) and adhere to data privacy regulations (e.g., GDPR, DPDPA).

Installation and Configuration of Digital Connectivity Equipment in Infrastructure

To be competent, the user/individual on the job must be able to:

PC6. Create efficient network architectures and topologies (e.g., star, mesh) that meet current and future data demands, adhering to IEEE, TIA/EIA, and ISO/IEC standards.

PC7. Install and manage routers, switches, and cabling (fiber-optic and copper) to ensure correct placement and minimize signal interference.

PC8. Configure digital connectivity devices by setting IP addresses, VLANs, routing protocols, and access controls.

PC9. Set up secure wireless networks, configuring Wi-Fi settings (SSID, encryption) and deploying PoE-enabled devices for power.

PC10. Test and verify device connections, signal strength, and latency, and diagnose issues like IP conflicts or misconfigurations.

Common Issues During Installation and Configuration in Infrastructure

To be competent, the user/individual on the job must be able to:

PC11. Identify and resolve physical issues like incorrectly wired cables or damaged components and troubleshoot defective networking devices.

PC12. Diagnose and resolve IP address conflicts and subnetting errors using network configuration tools.

PC13. Use network performance tools to measure and address bandwidth, latency, and packet loss issues.

PC14. Verify communication between devices using tools like ping and traceroute, identifying and rectifying issues with routing protocols.

PC15. Identify and address security vulnerabilities (e.g., weak passwords, improper firewall rules) and hardware/software compatibility challenges.

Workplace Safety

To be competent, the user/individual on the job must be able to:

PC16. Identify common construction site hazards, and implement safety barriers, signage, and lighting to mitigate risks.

PC17. Handle and store tools, equipment, and materials properly, selecting and using appropriate Personal Protective Equipment (PPE) for the working conditions.

PC18. Maintain high standards of personal hygiene and implement infection control practices to ensure a safe working environment.

PC19. Apply effective verbal and non-verbal communication skills, demonstrating professionalism and resolving conflicts calmly.

PC20. Adhere to audit procedures and work instructions, maintaining accurate incident records to ensure accountability and compliance.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Role of digital connectivity equipment (routers, switches, cables) in modern infrastructure and smart buildings.

KU2. Key telecommunication standards (Structured Cabling, Ethernet, Wi-Fi) and their importance for reliable network installation.

KU3. Various connectivity protocols (TCP/IP, UDP, HTTP, FTP) and their significance in data transmission.

KU4. The demand for scalable solutions, including high-speed networks (e.g., 5G), and how to select equipment that supports future developments.

KU5. Data handling and storage regulations (e.g., GDPR, DPDPA) to ensure data privacy and security.

KU6. Steps for installing routers, switches, and cabling according to industry standards for high data flow.

KU7. Key configuration protocols (TCP/IP, DNS, DHCP, NAT) and their roles in data routing and IP address management.

KU8. Various network topologies (star, mesh) and how they influence network performance and layout.

KU9. IEEE, TIA/EIA, and ISO/IEC standards for network design and cabling to ensure efficiency and scalability.

KU10. Common installation issues (IP conflicts, signal degradation) and troubleshooting techniques.

KU11. How faulty cables, defective devices, and incorrect configurations affect network performance.

KU12. Potential pitfalls of incorrect IP addressing, routing protocols, and security features.

KU13. Challenges related to hardware and software compatibility, such as outdated drivers or firmware.

KU14. How improper planning (inadequate bandwidth, poor segmentation) leads to network congestion and downtime.

KU15. How incorrect installation can cause performance degradation and how to use tools to diagnose and resolve these issues.

KU16. Common construction site safety hazards, emergency response procedures, and risk mitigation strategies.

KU17. Proper selection and use of PPE, and safe handling/storage of tools and materials.

KU18. Infection control measures and personal hygiene requirements in the workplace.

KU19. Importance of effective communication, professionalism, and conflict resolution in the workplace.

KU20. Procedures for audit preparation, following work instructions, and incident reporting for safety compliance.

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. Listen and communicate effectively and accurately.

GS2. Apply problem-solving approaches for different situations.

GS3. Work effectively in a team.

GS4. Employ proper time management.

GS5. Plan and organize work.

GS6. Maintain hygiene and sanitation.

GS7. Demonstrate analytical skills.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Understand the Industry Standards and Specifications for Digital Connectivity Equipment in Infrastructure	**10**	**13**	**-**	**3**
PC1. Select appropriate digital connectivity equipment and cabling based on infrastructure requirements, considering factors like bandwidth, latency, scalability, and cost.	-	-	-	-
PC2. Install and configure digital connectivity devices and cabling according to industry standards, optimizing network performance with correct IP addressing, VLANs, and routing.	-	-	-	-
PC3. Apply relevant telecommunication standards (e.g., Structured Cabling, TIA/EIA) and LAN technologies (e.g., Ethernet, Wi-Fi, PoE) for network installation and cabling.	-	-	-	-
PC4. Test network speed, bandwidth, and reliability using appropriate tools to ensure performance standards are met.	-	-	-	-
PC5. Diagnose and resolve network connectivity issues (e.g., signal loss, latency) and adhere to data privacy regulations (e.g., GDPR, DPDPA).	-	-	-	-
Installation and Configuration of Digital Connectivity Equipment in Infrastructure	**10**	**13**	**-**	**3**
PC6. Create efficient network architectures and topologies (e.g., star, mesh) that meet current and future data demands, adhering to IEEE, TIA/EIA, and ISO/IEC standards.	-	-	-	-
PC7. Install and manage routers, switches, and cabling (fiber-optic and copper) to ensure correct placement and minimize signal interference.	-	-	-	-
PC8. Configure digital connectivity devices by setting IP addresses, VLANs, routing protocols, and access controls.	-	-	-	-
PC9. Set up secure wireless networks, configuring Wi-Fi settings (SSID, encryption) and deploying PoE-enabled devices for power.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. Test and verify device connections, signal strength, and latency, and diagnose issues like IP conflicts or misconfigurations.	-	-	-	-
Common Issues During Installation and Configuration in Infrastructure	**10**	**12**	**-**	**2**
PC11. Identify and resolve physical issues like incorrectly wired cables or damaged components and troubleshoot defective networking devices.	-	-	-	-
PC12. Diagnose and resolve IP address conflicts and subnetting errors using network configuration tools.	-	-	-	-
PC13. Use network performance tools to measure and address bandwidth, latency, and packet loss issues.	-	-	-	-
PC14. Verify communication between devices using tools like ping and traceroute, identifying and rectifying issues with routing protocols.	-	-	-	-
PC15. Identify and address security vulnerabilities (e.g., weak passwords, improper firewall rules) and hardware/software compatibility challenges.	-	-	-	-
Workplace Safety	**10**	**12**	**-**	**2**
PC16. Identify common construction site hazards, and implement safety barriers, signage, and lighting to mitigate risks.	-	-	-	-
PC17. Handle and store tools, equipment, and materials properly, selecting and using appropriate Personal Protective Equipment (PPE) for the working conditions.	-	-	-	-
PC18. Maintain high standards of personal hygiene and implement infection control practices to ensure a safe working environment.	-	-	-	-
PC19. Apply effective verbal and non-verbal communication skills, demonstrating professionalism and resolving conflicts calmly.	-	-	-	-
PC20. Adhere to audit procedures and work instructions, maintaining accurate incident records to ensure accountability and compliance.	-	-	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ICE/TEL/N0304
NOS Name	Digital Connectivity Equipment Management and Workplace Safety Practices
Sector	Telecom
Sub-Sector	
Occupation	Digital Connectivity Infrastructure
NSQF Level	5.5
Credits	5
Version	1.0
Last Reviewed Date	08/05/2025
Next Review Date	08/05/2028
NSQC Clearance Date	08/05/2025

DGT/VSQ/N0102: Employability Skills (60 Hours)

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

Elements and Performance Criteria

Introduction to Employability Skills

To be competent, the user/individual on the job must be able to:

PC1. identify employability skills required for jobs in various industries

PC2. identify and explore learning and employability portals

Constitutional values – Citizenship

To be competent, the user/individual on the job must be able to:

PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.

PC4. follow environmentally sustainable practices

Becoming a Professional in the 21st Century

To be competent, the user/individual on the job must be able to:

PC5. recognize the significance of 21st Century Skills for employment

PC6. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

Basic English Skills

To be competent, the user/individual on the job must be able to:

PC7. use basic English for everyday conversation in different contexts, in person and over the telephone

PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English

PC9. write short messages, notes, letters, e-mails etc. in English

Career Development & Goal Setting

To be competent, the user/individual on the job must be able to:

PC10. understand the difference between job and career

PC11. prepare a career development plan with short- and long-term goals, based on aptitude

Communication Skills

To be competent, the user/individual on the job must be able to:

PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings

PC13. work collaboratively with others in a team

Diversity & Inclusion

To be competent, the user/individual on the job must be able to:

PC14. communicate and behave appropriately with all genders and PwD

PC15. escalate any issues related to sexual harassment at workplace according to POSH Act

Financial and Legal Literacy

To be competent, the user/individual on the job must be able to:

PC16. select financial institutions, products and services as per requirement

PC17. carry out offline and online financial transactions, safely and securely

PC18. identify common components of salary and compute income, expenses, taxes, investments etc

PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation

Essential Digital Skills

To be competent, the user/individual on the job must be able to:

PC20. operate digital devices and carry out basic internet operations securely and safely

PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively

PC22. use basic features of word processor, spreadsheets, and presentations

Entrepreneurship

To be competent, the user/individual on the job must be able to:

PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research

PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion

PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

Customer Service

To be competent, the user/individual on the job must be able to:

PC26. identify different types of customers

PC27. identify and respond to customer requests and needs in a professional manner.

PC28. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

To be competent, the user/individual on the job must be able to:

PC29. create a professional Curriculum vitae (Résumé)

PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

PC31. apply to identified job openings using offline /online methods as per requirement

PC32. answer questions politely, with clarity and confidence, during recruitment and selection

PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. need for employability skills and different learning and employability related portals

KU2. various constitutional and personal values

KU3. different environmentally sustainable practices and their importance

KU4. Twenty first (21st) century skills and their importance

KU5. how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up

KU6. importance of career development and setting long- and short-term goals

KU7. about effective communication

KU8. POSH Act

KU9. Gender sensitivity and inclusivity

KU10. different types of financial institutes, products, and services

KU11. how to compute income and expenditure

KU12. importance of maintaining safety and security in offline and online financial transactions

KU13. different legal rights and laws

KU14. different types of digital devices and the procedure to operate them safely and securely

KU15. how to create and operate an e- mail account and use applications such as word processors, spreadsheets etc.

KU16. how to identify business opportunities

KU17. types and needs of customers

KU18. how to apply for a job and prepare for an interview

KU19. apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and write different types of documents/instructions/correspondence

GS2. communicate effectively using appropriate language in formal and informal settings

GS3. behave politely and appropriately with all
GS4. how to work in a virtual mode
GS5. perform calculations efficiently
GS6. solve problems effectively
GS7. pay attention to details
GS8. manage time efficiently
GS9. maintain hygiene and sanitization to avoid infection

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Introduction to Employability Skills	**1**	**1**	**-**	**-**
PC1. identify employability skills required for jobs in various industries	-	-	-	-
PC2. identify and explore learning and employability portals	-	-	-	-
Constitutional values – Citizenship	**1**	**1**	**-**	**-**
PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC4. follow environmentally sustainable practices	-	-	-	-
Becoming a Professional in the 21st Century	**2**	**4**	**-**	**-**
PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC6. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
Basic English Skills	**2**	**3**	**-**	**-**
PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC9. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
Career Development & Goal Setting	**1**	**2**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. understand the difference between job and career	-	-	-	-
PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
Communication Skills	**2**	**2**	**-**	**-**
PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
PC13. work collaboratively with others in a team	-	-	-	-
Diversity & Inclusion	**1**	**2**	**-**	**-**
PC14. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
Financial and Legal Literacy	**2**	**3**	**-**	**-**
PC16. select financial institutions, products and services as per requirement	-	-	-	-
PC17. carry out offline and online financial transactions, safely and securely	-	-	-	-
PC18. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
Essential Digital Skills	**3**	**4**	**-**	**-**
PC20. operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Entrepreneurship	**2**	**3**	**-**	**-**
PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
Customer Service	**1**	**2**	**-**	**-**
PC26. identify different types of customers	-	-	-	-
PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
PC28. follow appropriate hygiene and grooming standards	-	-	-	-
Getting ready for apprenticeship & Jobs	**2**	**3**	**-**	**-**
PC29. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC31. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total	**20**	**30**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0102
NOS Name	Employability Skills (60 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	20/12/2022
Next Review Date	20/12/2025
NSQC Clearance Date	20/12/2022

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Awarding Body. Each Performance Criteria (PC)/ Element will be assigned marks proportional to its importance in NOS. AB will also lay down proportion of marks for Theory and Skills Practical for each PC/ Element.

2. The assessment for the knowledge part will be based on knowledge bank of questions created by Assessment Bodies subject to approval by AB.

3. Individual assessment agencies will create unique question papers for knowledge/theory part for assessment of candidates as per assessment criteria given below.

4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on assessment criteria.

5. The passing percentage for each QP will be 70%. To pass the Qualification Pack, every trainee should score a minimum of 70% individually in each NOS.

6. The Assessor shall check the final outcome of the practices while evaluating the steps performed to achieve the final outcome.

7. The trainee shall be provided with a chance to repeat the test to correct his procedures in case of improper performance, with a deduction of marks for each iteration.

8. After the certain number of iterations as decided by AB the trainee is marked as fail, scoring zero marks for the procedure for the practical activity.

9. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack within the specified time frame set by AB.

10. Minimum duration of Assessment of each QP shall be of 4hrs/trainee.

Minimum Aggregate Passing % at QP Level : 70

(**Please note**: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Minimum Passing % at NOS Level: 70

(**Please note**: A Trainee must score the minimum percentage for each NOS separately as well as on the QP as a whole.)

Assessment Weightage

Compulsory NOS

Qualification Pack

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ICE/TEL/N0301.Basics of Digital Connectivity Infrastructure (DCI)	40	50	-	10	100	20
ICE/TEL/N0302.Design Electrical Systems in Infrastructure	40	50	-	10	100	25
ICE/TEL/N0303.Design Information and Communication Technology Systems in Infrastructure	40	50	-	10	100	30
ICE/TEL/N0304.Digital Connectivity Equipment Management and Workplace Safety Practices	40	50	-	10	100	20
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	-	-	50	5
Total	**180**	**230**	**-**	**40**	**450**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
EMF	Electromotive force
LV	Low-Voltage
AC	Alternating Current
DC	Direct Current
DB	Distribution Boards
APFC	Automatic Power Factor Control
MCB	Miniature Circuit Breaker
ELCB	Earth Leakage Circuit Breaker
CCTV	Closed-Circuit Television
HVAC	Heating, Ventilation, and Air Conditioning
BMS	Building Management System
BIM	BIM Building Information Modeling

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.