Qualification Pack

IoT Hardware Analyst

QP Code: ELE/Q1405

Version: 4.0

NSQF Level: 5

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ELE/Q1405: IoT Hardware Analyst

Brief Job Description

The individual in this job role prepares a complete blueprint of the hardware including schematics layout, quality verification requirements and perform PCB testing in compliance with regulatory standards to records them in a design document. The individual will also be responsible for working and efficient functioning of the system.

Personal Attributes

The individual must have attention to details, logical thinking, and ability to execute the project as per clients requirement. This job requires the individual to work collaboratively with diverse teams. The individual should be able to hold interest in technology changes, demonstrate strong technical expertise and possess good oral and written communications skills. The individual should also be comfortable working with deadlines and budgets.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. ELE/N1424: Prepare detailed requirements and design specification documents
2. ELE/N1425: Develop the circuit schematic and PCB layout for the IoT system.
3. ELE/N1426: Assemble and perform testing of the complete IoT solution
4. DGT/VSQ/N0102: Employability Skills (60 Hours)

Qualification Pack (QP) Parameters

Sector	Electronics
Sub-Sector	Semiconductor & Components
Occupation	Product Design-S&C
Country	India
NSQF Level	5
Credits	15
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2152.0801

Minimum Educational Qualification & Experience	Completed 2nd year of UG (UG Diploma) (Physics/Electronics/Electrical/Computer Science) with 1.5 years of experience Relevant experience in Electronics domain OR Completed 3 year diploma after 10th (Electronics/Electrical/Computer Science) with 3 Years of experience Relevant experience in Electronics domain OR Previous relevant Qualification of NSQF Level (4.5) with 1.5 years of experience Relevant experience in Electronics domain
Minimum Level of Education for Training in School	10th Class
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	NA
Next Review Date	30/04/2028
NSQC Approval Date	08/05/2025
Version	4.0
Reference code on NQR	QG-05-EH-03971-2025-V4-ESSCI
NQR Version	4.0

Remarks:

NA

Qualification Pack

ELE/N1424: Prepare detailed requirements and design specification documents

Description

This NOS unit is about define, design, and validate IoT system requirements and architecture while ensuring compliance with technical, regulatory, and interoperability standards through collaboration, documentation, simulation, and quality assurance."

Scope

The scope covers the following :

- Prepare documents highlighting the requirements and system specifications
- Create a detailed design document

Elements and Performance Criteria

Prepare documents highlighting the requirements and system specifications

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

PC1. Verify the high-level design and connectivity requirements using modern IoT frameworks and advanced simulation tools.

PC2. Ensure that the need and requirement for inter- operability between various connectivity interfaces is maintained

PC3. List the protocols that facilitate the handshakes between different connected devices in the IoT system

PC4. Develop detailed flowcharts and connected diagrams using advanced tools (e.g., Lucid chart, Visio) to represent machine-to-machine (M2M) communication and data flows.

PC5. Manage the manufacturing processes involved and the integration requirements of the system to ensure all equipment needed for validation and testing the system is available

PC6. Use dependency management tools to identify critical stages and mitigate process constraints.

PC7. Highlight and automate trigger mechanisms for each system component using IoT middleware platforms.

PC8. Incorporate cybersecurity measures and data encryption protocols in all design stages to enhance safety and security.

PC9. Ensure that globally accepted regulatory standards for the technical specifications have been considered while listing specifications and system requirements

PC10. Supervise the finalization of requirements and specifications along with other determinants required for proper design and development such as parameters to be recorded, specific connectivity need at each interface, etc.

PC11. Collaborate with stakeholders to confirm safety requirements and obtain formal approval for requirement specifications.

Create a detailed design document

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

PC12. Review functional specifications using digital collaboration platforms for real-time feedback and updates.

PC13. Ensure that an alternative design analysis has been prepared which describes all possible options/solutions for the requirements specifications

PC14. Verify that the IoT system matches the technical specifications and confirms with the evaluation criteria and appropriate components to be deployed

PC15. Ensure that reusable components, relevant best practices and design standards have been used and followed as per the organization's knowledge base

PC16. Prepare for the component and human resources requirements from various domains such as chip design (if any), board design, layout designers, connectivity protocol experts, firm ware designers, verification and validation folks, etc.

PC17. Utilize advanced simulation and synthesis tools (e.g., MATLAB, Cadence) for analyzing electronic circuit designs.

PC18. Validate that the designed system meets current quality standards and user expectations, including predictive maintenance and self-healing capabilities.

PC19. Review strategies used by the designed system for energy efficiency, environmental standards and safety measures

PC20. Check noise and electromagnetic interface (EMI) and electromagnetic compatibility (EMC) requirements in electrical and electronic systems

PC21. Guide initial assessment of the entire system while outlining the possible delivery output with the client and seek their approval

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Understanding of IoT system architecture, including hardware, software, and communication layers.

KU2. Knowledge of modern IoT frameworks and simulation tools (e.g., MATLAB, Cadence, Cisco Packet Tracer).

KU3. Awareness of interoperability standards and connectivity protocols like MQTT, CoAP, HTTP, Zigbee, BLE, and LoRa.

KU4. Familiarity with regulatory standards (e.g., ISO/IEC, IEEE, ETSI) and industry-specific compliance requirements.

KU5. Concepts of machine-to-machine (M2M) communication and data flow visualization using tools like Lucidchart and Visio.

KU6. Principles of cybersecurity, including data encryption, secure protocols, and threat mitigation in IoT systems.

KU7. Knowledge of manufacturing and integration processes for electronic and embedded systems.

KU8. Proficiency in component-level circuit design, synthesis, and validation using advanced tools.

KU9. Understanding of energy efficiency, EMI/EMC standards, and environmental considerations in IoT designs.

KU10. Project planning and dependency management techniques including critical path identification and resource estimation.

Generic Skills (GS)

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

GS1. Ability to analyze requirements and create clear, well-structured technical documentation.

GS2. Proficiency in using digital collaboration platforms (e.g., Jira, Confluence, Google Workspace) for real-time reviews.

GS3. Effective verbal and written communication for stakeholder engagement and cross-functional collaboration.

GS4. Critical thinking and problem-solving skills for evaluating alternative design options.

GS5. Project management and planning skills for coordinating tasks across teams and domains.

GS6. Attention to detail in verifying compliance with technical specifications and regulatory guidelines.

GS7. Ability to interpret and create detailed flowcharts and system diagrams for complex processes.

GS8. Capability to manage and estimate hardware/software resource requirements.

GS9. Skill in identifying automation opportunities and implementing trigger mechanisms through middleware platforms.

GS10. Leadership and decision-making skills to guide the initial system assessment and secure client approvals.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare documents highlighting the requirements and system specifications	**22**	**26**	**-**	**5**
PC1. Verify the high-level design and connectivity requirements using modern IoT frameworks and advanced simulation tools.	-	-	-	-
PC2. Ensure that the need and requirement for inter-operability between various connectivity interfaces is maintained	-	-	-	-
PC3. List the protocols that facilitate the handshakes between different connected devices in the IoT system	-	-	-	-
PC4. Develop detailed flowcharts and connected diagrams using advanced tools (e.g., Lucid chart, Visio) to represent machine-to-machine (M2M) communication and data flows.	-	-	-	-
PC5. Manage the manufacturing processes involved and the integration requirements of the system to ensure all equipment needed for validation and testing the system is available	-	-	-	-
PC6. Use dependency management tools to identify critical stages and mitigate process constraints.	-	-	-	-
PC7. Highlight and automate trigger mechanisms for each system component using IoT middleware platforms.	-	-	-	-
PC8. Incorporate cybersecurity measures and data encryption protocols in all design stages to enhance safety and security.	-	-	-	-
PC9. Ensure that globally accepted regulatory standards for the technical specifications have been considered while listing specifications and system requirements	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. Supervise the finalization of requirements and specifications along with other determinants required for proper design and development such as parameters to be recorded, specific connectivity need at each interface, etc.	-	-	-	-
PC11. Collaborate with stakeholders to confirm safety requirements and obtain formal approval for requirement specifications.	-	-	-	-
Create a detailed design document	**18**	**24**	**-**	**5**
PC12. Review functional specifications using digital collaboration platforms for real-time feedback and updates.	-	-	-	-
PC13. Ensure that an alternative design analysis has been prepared which describes all possible options/solutions for the requirements specifications	-	-	-	-
PC14. Verify that the IoT system matches the technical specifications and confirms with the evaluation criteria and appropriate components to be deployed	-	-	-	-
PC15. Ensure that reusable components, relevant best practices and design standards have been used and followed as per the organization’s knowledge base	-	-	-	-
PC16. Prepare for the component and human resources requirements from various domains such as chip design (if any), board design, layout designers, connectivity protocol experts, firm ware designers, verification and validation folks, etc.	-	-	-	-
PC17. Utilize advanced simulation and synthesis tools (e.g., MATLAB, Cadence) for analyzing electronic circuit designs.	-	-	-	-
PC18. Validate that the designed system meets current quality standards and user expectations, including predictive maintenance and self-healing capabilities.	-	-	-	-
PC19. Review strategies used by the designed system for energy efficiency, environmental standards and safety measures	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. Check noise and electromagnetic interface (EMI) and electromagnetic compatibility (EMC) requirements in electrical and electronic systems	-	-	-	-
PC21. Guide initial assessment of the entire system while outlining the possible delivery output with the client and seek their approval	-	-	-	-
NOS Total	**40**	**50**	**-**	**10**

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	ELE/N1424
NOS Name	Prepare detailed requirements and design specification documents
Sector	Electronics
Sub-Sector	
Occupation	Product Design-S&C
NSQF Level	5
Credits	5
Version	1.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

ELE/N1425: Develop the circuit schematic and PCB layout for the IoT system.

Description

This NOS unit is about design, prototype, and validate hardware systems for IoT applications, ensuring component selection, connectivity, safety, performance optimization, and regulatory compliance using advanced tools and methodologies.

Scope

The scope covers the following :

- Develop a design for the hardware system
- Build a prototype
- Test the functionality and usability of the prototype

Elements and Performance Criteria

Develop a design for the hardware system

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

PC1. Verify prescribed safety guidelines and check microcontroller(or microprocessor) with the desired Read Only Memory (ROM) and frequency to meet the processing requirements of the application

PC2. Check that the pin configurations for all components based on input and output requirements have been met

PC3. Review the right connectivity modules and other components as per requirement specifications

Build a prototype

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

PC4. Test voltage levels and integrate advanced power management ICs to ensure stable power delivery.

PC5. Check all connectivity interfaces required between the components of the system, both wired and wireless (short range and long range)

PC6. Verify that each component functions as per the design requirements for the system

PC7. Use agile project management tools to allocate resources and track progress effectively.

PC8. Monitor component selection and connectivity methods to balance technical and cost requirements.

PC9. Perform advanced simulations, including thermal analysis and noise reduction, to optimize system performance.

Test the functionality and usability of the prototype

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

PC10. Monitor component interactions using IoT analytics platforms and ensure proper triggering of events.

PC11. Validate programming languages and firmware (e.g., Python, Embedded C) for optimized device communication.

PC12. Verify the prototype and perform a pilot run of the entire system in the simulated client environment

PC13. Guide alternate solutions based on optimization techniques and perform minor revisions through what-if scenarios and document the pros and cons

PC14. Ensure compliance with updated regulatory, safety, and environmental standards for manufacturing PCBs and chips.

PC15. Test one prototype solution (or may be two) and prepare detailed notes of the specifications (dimensions, functional, constraints)

PC16. Prepare a comprehensive Bill of Materials (BOM) and ensure alignment with client requirements.

PC17. Use advanced PCB design tools to define stack-ups, placement, routing, and impedance matching requirements.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Knowledge of microcontrollers/microprocessors and their specifications (ROM, clock speed, GPIO configurations).

KU2. Understanding of pin configuration, I/O mapping, and interfacing techniques for electronic components.

KU3. Familiarity with connectivity modules (e.g., Wi-Fi, Bluetooth, Zigbee, LoRa) and selection based on system requirements.

KU4. Principles of power management, including voltage regulation, power ICs, and energy-efficient design practices.

KU5. Understanding of wired and wireless communication protocols and their integration in hardware systems.

KU6. Knowledge of agile project management tools (e.g., Jira, Trello) for resource allocation and progress tracking.

KU7. Proficiency in simulation tools for thermal analysis, EMI/EMC, and signal integrity (e.g., ANSYS, LTSpice).

KU8. Basics of IoT analytics platforms for monitoring system performance and real-time event triggering.

KU9. Programming skills in embedded systems languages (e.g., Embedded C, Python) for hardware-software integration.

KU10. Regulatory knowledge related to hardware design, such as PCB manufacturing standards, environmental and safety compliance (RoHS, ISO, IEC).

Generic Skills (GS)

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

GS1. Ability to interpret technical documentation and convert specifications into hardware design.

GS2. Analytical skills to select and balance cost-effective components without compromising performance.

GS3. Problem-solving skills to revise designs using what-if scenarios and document trade-off.

GS4. Proficiency in using PCB design tools (e.g., Altium Designer, Eagle, KiCad) for layout, routing, and impedance matching.

GS5. Project management and team coordination using agile methods and collaboration tools.

GS6. Communication skills to document and present detailed prototype specifications and Bill of Materials (BOM).

GS7. Critical thinking to validate firmware, software compatibility, and overall device functionality.

GS8. Ability to monitor and optimize system interactions through analytics and event-driven platforms.

GS9. Attention to detail to ensure all hardware components function as per design in test and real-world environments.

GS10. Capability to ensure compliance with safety, environmental, and technical standards during prototyping and testing.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Develop a design for the hardware system	**9**	**10**	**-**	**3**
PC1. Verify prescribed safety guidelines and check microcontroller(or microprocessor) with the desired Read Only Memory (ROM) and frequency to meet the processing requirements of the application	-	-	-	-
PC2. Check that the pin configurations for all components based on input and output requirements have been met	-	-	-	-
PC3. Review the right connectivity modules and other components as per requirement specifications	-	-	-	-
Build a prototype	**15**	**17**	**-**	**4**
PC4. Test voltage levels and integrate advanced power management ICs to ensure stable power delivery.	-	-	-	-
PC5. Check all connectivity interfaces required between the components of the system, both wired and wireless (short range and long range)	-	-	-	-
PC6. Verify that each component functions as per the design requirements for the system	-	-	-	-
PC7. Use agile project management tools to allocate resources and track progress effectively.	-	-	-	-
PC8. Monitor component selection and connectivity methods to balance technical and cost requirements.	-	-	-	-
PC9. Perform advanced simulations, including thermal analysis and noise reduction, to optimize system performance.	-	-	-	-
Test the functionality and usability of the prototype	**16**	**23**	**-**	**3**
PC10. Monitor component interactions using IoT analytics platforms and ensure proper triggering of events.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. Validate programming languages and firmware (e.g., Python, Embedded C) for optimized device communication.	-	-	-	-
PC12. Verify the prototype and perform a pilot run of the entire system in the simulated client environment	-	-	-	-
PC13. Guide alternate solutions based on optimization techniques and perform minor revisions through what-if scenarios and document the pros and cons	-	-	-	-
PC14. Ensure compliance with updated regulatory, safety, and environmental standards for manufacturing PCBs and chips.	-	-	-	-
PC15. Test one prototype solution (or may be two) and prepare detailed notes of the specifications (dimensions, functional, constraints)	-	-	-	-
PC16. Prepare a comprehensive Bill of Materials (BOM) and ensure alignment with client requirements.	-	-	-	-
PC17. Use advanced PCB design tools to define stack-ups, placement, routing, and impedance matching requirements.	-	-	-	-
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ELE/N1425
NOS Name	Develop the circuit schematic and PCB layout for the IoT system.
Sector	Electronics
Sub-Sector	
Occupation	Product Design-S&C
NSQF Level	5
Credits	4
Version	1.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

ELE/N1426: Assemble and perform testing of the complete IoT solution

Description

This NOS unit is about assemble, configure, test, and validate IoT systems using advanced tools and methodologies, ensuring functional accuracy, compliance, and performance through diagnostic analysis, automation, and quality assurance processes.

Scope

The scope covers the following :

- Build the IoT system
- Configure and test the system
- Validate the system correctness against specifications

Elements and Performance Criteria

Build the IoT system

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

PC1. Verify that the appropriate manufacturing technology is used to build the system (PCBs and the ICs) for required components as well as their functionality

PC2. Document probing points for components using updated design tools for better traceability.

PC3. Test PCBs using modern test equipment like logic analyzers, spectrum analyzers, and IoT-specific debugging tools.

Configure and test the system

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

PC4. Validate input-output points using IoT testing frameworks and ensure proper triggering of desired events.

PC5. Perform automated system testing using DevOps pipelines and document test results comprehensively.

PC6. Troubleshoot system anomalies using AI-powered diagnostic tools and resolve design defects.

PC7. Test the system for various applications, leveraging cloud-based IoT platforms for scalability and performance analysis.

Validate the system correctness against specifications

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

PC8. Observe and interpret test results against specifications and check for compliance against the specifications

PC9. Perform RF tuning and analysis using advanced tools for boards with RF interfaces, ensuring optimal performance.

PC10. Conduct root cause analysis with predictive analytics to resolve discrepancies between test results and specifications.

PC11. Document changes in specifications or design and finalize the IoT system using updated quality assurance processes.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Understanding of manufacturing technologies used in PCB and IC fabrication relevant to IoT systems.

KU2. Knowledge of design tools for documenting probing points and ensuring traceability in complex hardware systems.

KU3. Familiarity with modern electronic test equipment such as logic analyzers, oscilloscopes, and spectrum analyzers.

KU4. Knowledge of IoT testing frameworks and techniques for validating I/O points and event triggering.

KU5. Awareness of DevOps practices and tools used in automating system testing and continuous integration pipelines.

KU6. Understanding of AI-powered diagnostic tools and techniques for system-level troubleshooting and fault resolution.

KU7. Knowledge of cloud-based IoT platforms (e.g., AWS IoT, Azure IoT, Google Cloud IoT) for application testing and scalability analysis.

KU8. Competency in RF tuning and analysis for optimizing performance in IoT devices with wireless communication interfaces.

KU9. Knowledge of root cause analysis and predictive analytics tools for identifying and resolving test-result discrepancies.

KU10. Awareness of updated quality assurance processes and regulatory standards for finalizing IoT system designs.

Generic Skills (GS)

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

GS1. Analytical skills to interpret system test results and assess compliance with design specifications.

GS2. Attention to detail in documenting probing points, test outcomes, and changes in design/specifications.

GS3. Proficiency in using diagnostic and debugging tools to identify faults and system anomalies.

GS4. Technical writing skills to prepare thorough reports, test documentation, and system validation records.

GS5. Problem-solving abilities to resolve functional and performance issues through structured troubleshooting.

GS6. Ability to manage testing environments and simulate real-world applications using IoT platforms.

GS7. Adaptability to integrate automated testing workflows using DevOps and CI/CD pipelines.

GS8. Communication skills for collaboration with cross-functional teams during testing and validation stages.

GS9. Critical thinking for performing RF optimization and analyzing the impact of wireless performance issues.

GS10. Time and resource management skills to efficiently execute and finalize the build-validation cycle of the IoT system.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Build the IoT system	**12**	**15**	**-**	**3**
PC1. Verify that the appropriate manufacturing technology is used to build the system (PCBs and the ICs) for required components as well as their functionality	-	-	-	-
PC2. Document probing points for components using updated design tools for better traceability.	-	-	-	-
PC3. Test PCBs using modern test equipment like logic analyzers, spectrum analyzers, and IoT-specific debugging tools.	-	-	-	-
Configure and test the system	**15**	**19**	**-**	**4**
PC4. Validate input-output points using IoT testing frameworks and ensure proper triggering of desired events.	-	-	-	-
PC5. Perform automated system testing using DevOps pipelines and document test results comprehensively.	-	-	-	-
PC6. Troubleshoot system anomalies using AI-powered diagnostic tools and resolve design defects.	-	-	-	-
PC7. Test the system for various applications, leveraging cloud-based IoT platforms for scalability and performance analysis.	-	-	-	-
Validate the system correctness against specifications	**13**	**16**	**-**	**3**
PC8. Observe and interpret test results against specifications and check for compliance against the specifications	-	-	-	-
PC9. Perform RF tuning and analysis using advanced tools for boards with RF interfaces, ensuring optimal performance.	-	-	-	-
PC10. Conduct root cause analysis with predictive analytics to resolve discrepancies between test results and specifications.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. Document changes in specifications or design and finalize the IoT system using updated quality assurance processes.	-	-	-	-
NOS Total	**40**	**50**	**-**	**10**

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	ELE/N1426
NOS Name	Assemble and perform testing of the complete IoT solution
Sector	Electronics
Sub-Sector	
Occupation	Product Design-S&C
NSQF Level	5
Credits	4
Version	1.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

Qualification Pack

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	08/05/2025
Next Review Date	31/10/2025
NSQC Clearance Date	08/05/2025

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.

2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.

3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below.)

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

5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS.

6. 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

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.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ELE/N1424.Prepare detailed requirements and design specification documents	40	50	-	10	100	30
ELE/N1425.Develop the circuit schematic and PCB layout for the IoT system.	40	50	-	10	100	30
ELE/N1426.Assemble and perform testing of the complete IoT solution	40	50	-	10	100	20
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	-	-	50	20
Total	**140**	**180**	**-**	**30**	**350**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

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.