Qualification Pack

Advance Mechatronics- Designer and Planner Lead

QP Code: CSC/Q

Version: 1.0

NSQF Level: 6

Capital Goods and Strategic Skill Council ||39,1st Floor, Samyak Tower, Pusa Rd, Block 9A, WEA, Karol Bagh, New Delhi, 110005Email: coo@cgsc.in

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CSC/Q: Advance Mechatronics- Designer and Planner Lead

Brief Job Description

Designer and Planner Lead in Advanced Mechatronics is responsible for the conceptualization, design, planning, and execution of sophisticated mechatronic systems.

Personal Attributes

The person should be result oriented with good technical and analytical skills, should have Excellent Interpersonal Skills, communication and presentation skills and a good team player. They should have ability to manage projects, prioritizing of work and mentoring the budding engineers.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. **CSC/N: Lead/Oversee the System integration of machines with PLC and SCADA system.**
2. **CSC/N: Perform the Data Analytics motion on the retrieved data from the mechatronic systems and perform control feedback process.**
3. **CSC/N: Design the panels using CAD tools allowing proper tolerance and dimensions for individual components.**

Qualification Pack (QP) Parameters

Sector	Capital Goods
Sub-Sector	1. Plant Machinery 2. Robotics System Integration
Occupation	Design and Development
Country	India
NSQF Level	6
Aligned to NCO/ISCO/ISIC Code	
Minimum Educational Qualification & Experience	3 years Diploma (Mechanical/Automobile/ Electrical / Electronics) after class 10th from recognized regulatory body with 3 years of relevant experience. OR B.E./B.Tech in the relevant field with 1 Year of relevant experience. OR M.E./M.Tech in the relevant field OR Certificate-NSQF Level 5.5 with 1.5 Years of relevant experience.

Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	21 Years
Last Reviewed On	
Next Review Date	
Deactivation Date	
NSQC Approval Date	
Version	1.0

CSC/N: Lead/Oversee the System integration of machines with PLC and SCADA system.

Brief Job Description

This NOS unit is about to Lead/Oversee the System integration of machines with PLC and SCADA system.

Scope

The scope covers the following:

- Select & Develop System Design, Architecture & Configuration for PLC & SCADA System
- Conduct integration & implementation of PLCs & SCADA Systems.
- Perform post-integration activities like Testing & Validation.

Elements and Performance Criteria

- *Select & Develop System Design, Architecture & Configuration for PLC & SCADA System*

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

PC1. identify and analyze the operational needs from stakeholders and select appropriate PLC hardware and SCADA software based on performance criteria and compatibility.

PC2. Prepare high-level and detailed system architecture, create control logic, and configure SCADA interfaces to ensure seamless integration and effective operation of all components.

PC3. Perform comprehensive system testing to validate performance, provide training for operators and maintenance personnel, and maintain detailed documentation for compliance and continuous improvement.

- *Perform integration & implementation of PLCs & SCADA Systems.*

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

PC4.Conduct Integration of PLCs, SCADA systems, sensors, actuators, and network devices, ensuring all components communicate effectively and function as a cohesive unit.

PC5. Implement configuration of PLCs and SCADA software according to design specifications, and perform rigorous testing, including functional, performance, and reliability tests, to validate that the system meets all operational requirements.

PC6. Develop and deliver training programs for operators and maintenance personnel, and maintain comprehensive documentation to support system operation, maintenance, and compliance with industry standards.

□□ • *Perform post-integration activities like Testing & Validation.*

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

PC7. Perform thorough functional, performance, and reliability tests to ensure the integrated PLC and SCADA systems operate correctly and meet all specified requirements.

PC8. Carry out Factory Acceptance Testing (FAT) and Site Acceptance Testing (SAT) to confirm that the system performs as expected in both controlled and real-world environments.

PC9.prepare document testing procedures, results, and any issues encountered during testing, and effectively communicate findings to stakeholders.

PC10. Implement corrective actions as needed based on testing outcomes to ensure the reliability and effectiveness of the integrated systems.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation procedures for health, safety and security, individual role and responsibilities in this context

KU2. the organisation's emergency procedures for different emergency situations and the importance of following the same

KU3. PLC Fundamentals & SCADA System Basics: A deep understanding of Basic principles of PLC operation, including input/output (I/O) handling, data processing, and program execution. Different types of PLC hardware, such as modular and compact PLCs, and their applications in industrial automation. Core functionalities of SCADA systems, including data acquisition, monitoring, control, and visualization.

KU4. Programming and Software Development: Proficiency in Common PLC programming languages like Ladder Logic, Function Block Diagram (FBD), Structured Text (ST), and Sequential Function Chart (SFC). Scripting languages used in SCADA systems for customization and automation, such as Visual Basic for Applications (VBA) or JavaScript.

KU4. Communication Engineering: Understanding of popular communication protocols used in industrial automation, such as Modbus, Profibus, Ethernet/IP, and OPC. Knowledge of protocols for interfacing PLCs and SCADA systems with other devices and networks.

KU5. System Design Principles: Understanding the principles of system design, including modularity, scalability, reliability, and maintainability. Considerations for selecting hardware and software components based on system requirements and performance criteria.

KU6. Safety and Security Standards Understanding of safety standards (e.g., IEC 61508, ISO 13849) and regulations applicable to industrial automation systems. Knowledge of cybersecurity principles and best practices for protecting PLC and SCADA systems from cyber threats. Understanding of industry standards and regulatory requirements relevant to PLC and SCADA systems, such as ISA-95, IEC 61131, and FDA regulations for certain industries.

KU7. Testing and Validation: Knowledge of techniques used for conducting functional testing, performance testing, and reliability testing of PLC and SCADA systems. Methods for validating system performance through Factory Acceptance Testing (FAT) and Site Acceptance Testing (SAT).

KU8. Project Management: Proficiency in project management principles including scope definition, resource allocation, timeline management, and risk assessment. Collaboration and communication skills necessary for working effectively in multidisciplinary teams and coordinating project activities.

Generic Skills (GS)

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

GS1. read safety instructions/guidelines
GS2. modify work practices to improve them
GS3. work with supervisors/team members to carry out work related tasks
GS4. complete tasks efficiently and accurately within stipulated time
GS5. inform/report to concerned person in case of any problem
GS6. make timely decisions for efficient utilization of resources
GS7. write reports such as accident report, in at least English/regional language

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Select & Develop System Design, Architecture & Configuration for PLC & SCADA System	10	10	-	6
PC1. identify and analyze the operational needs from stakeholders and select appropriate PLC hardware and SCADA software based on performance criteria and compatibility.	3	2	-	2
PC2. Prepare high-level and detailed system architecture, create control logic, and configure SCADA interfaces to ensure seamless integration and effective operation of all components.	3	4	-	2
PC3. Perform comprehensive system testing to validate performance, provide training for operators and maintenance personnel, and maintain detailed documentation for compliance and continuous improvement.	4	4	-	2
Perform integration & implementation of PLCs & SCADA Systems.	15	15	-	10
PC4. Conduct Integration of PLCs, SCADA systems, sensors, actuators, and network devices, ensuring all components communicate effectively and function as a cohesive unit	5	5	-	3
PC5. Implement configuration of PLCs and SCADA software according to design specifications, and perform rigorous testing, including functional, performance, and reliability tests, to validate that the system meets all operational requirements.	5	5	-	3
PC6.Develop and deliver training programs for operators and maintenance personnel, and maintain comprehensive documentation to support system operation, maintenance, and compliance with industry standards.	5	5	-	4

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform post-integration activities like Testing & Validation.	15	15	-	4
PC7. Perform thorough functional, performance, and reliability tests to ensure the integrated PLC and SCADA systems operate correctly and meet all specified requirements.	5	4	-	1
PC8. Carry out Factory Acceptance Testing (FAT) and Site Acceptance Testing (SAT) to confirm that the system performs as expected in both controlled and real-world environments.	4	3	-	1
PC9. prepare document testing procedures, results, and any issues encountered during testing, and effectively communicate findings to stakeholders.	3	4	-	1
PC10. Implement corrective actions as needed based on testing outcomes to ensure the reliability and effectiveness of the integrated systems.	3	4		1
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N
NOS Name	Lead/Oversee the System integration of machines with PLC and SCADA system.
Sector	Capital Goods
Sub-Sector	1 Plant Machinery 2. Robotics System Integration
Occupation	Design and Development
NSQF Level	6
Credits	2
Version	1.0
Last Reviewed Date	
Next Review Date	
NSQC Clearance Date	

CSC/N: Perform the Data Analytics motion on the retrieved data from the mechatronic systems and perform control feedback process.

Description

This unit is about to perform Data Analytics motion on the retrieved data from the mechatronic systems and perform control feedback process.

Scope

The scope covers the following:

- Perform data collection and analysis of data from mechatronic systems
- Develop and integrate control algorithms to establish feedback loops
- Conduct post-Control integration activities for continuous improvement

Elements and Performance Criteria

▫▫ *Perform data collection and analysis of data from mechatronic systems*

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

PC1.Implement the identification and gathering of relevant data from sensors, actuators, PLCs, and SCADA systems within the mechatronic setup, ensuring data accuracy, completeness, and preprocessing to handle noise and missing values.

PC2. Utilizing descriptive, predictive, and prescriptive analytics methods to process and analyze the data, extracting meaningful insights and identifying patterns, trends, and potential issues within the system.

PC3. Creation of clear and informative visualizations, dashboards, and reports to present the analyzed data, highlighting key insights, performance metrics, and recommendations for system optimization and decision-making.

▫▫ *Develop and integrate control algorithms to establish feedback loops*

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

PC4. Develop control algorithms based on system requirements and data insights, ensuring they effectively manage and adjust system operations in response to real-time data.

PC5. Integrate these control algorithms into the mechatronic system, establishing robust feedback loops that allow for dynamic adjustments to operational parameters to maintain optimal performance.

PC6. Perform rigorous testing and validation of the control algorithms and feedback loops to ensure they function correctly under various conditions, making necessary adjustments to enhance reliability and effectiveness.

▫ ▫ *Perform post-Control integration activities for continuous improvement*

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

PC7. Perform continuous monitoring of the integrated control systems and feedback loops, using real-time data

to track performance and identify any deviations from desired operating conditions.

PC8. Conduct regular analysis of performance data to detect trends, anomalies, and areas for improvement, leveraging advanced analytics tools and techniques.

PC9. Apply insights gained from performance analysis to refine and optimize control algorithms and system parameters, ensuring ongoing enhancements to system efficiency and reliability.

PC10. Prepare detailed documentation of all improvements and adjustments made, and effectively communicate these changes to relevant stakeholders to ensure transparency and alignment with operational goals.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation procedures for health, safety and security, individual role and responsibilities in this context

KU2. the organisation's emergency procedures for different emergency situations and the importance of following the same

KU3. Fundamentals of Data Analytics: In-depth understanding Basic concepts of data analytics, including descriptive, predictive, and prescriptive analytics. Knowledge of techniques for data preprocessing, such as data cleaning, normalization, and handling missing values.

KU4. Mechatronic Systems: Familiarity with Principles of mechatronic systems, including the integration of mechanical, electronic, and software components. Knowledge of types and functions of sensors, actuators, PLCs, and SCADA systems used in mechatronics.

KU5. Control Theory and Algorithms: Knowledge of basic principles of control theory, including feedback loops and system stability. Knowledge of development and tuning of control algorithms to maintain desired system performance.

KU6. Industrial Communication Protocols: Understanding of common industrial communication protocols, such as Modbus, Profibus, Ethernet/IP, and OPC. Knowledge of methods for ensuring reliable data transmission between system components.

KU7. Real-Time Monitoring and Control: Understanding of techniques for real-time monitoring of system performance and detecting deviations. Implementation of real-time control adjustments based on data analytics insights.

KU8. Testing, Validation, and Continuous Improvement: Knowledge of procedures for testing and validating control systems, including functional, performance, and reliability testing. Understanding of strategies for continuous improvement, incorporating feedback from performance data and ensuring adherence to safety and cybersecurity standards.

Generic Skills (GS)

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

GS1. follow instructions, guidelines, procedures, rules, and service level agreements
GS2. listen effectively and communicate information accurately
GS3. follow rule-based decision-making processes
GS4. make decisions on suitable courses
GS5. plan and organize the work to achieve targets and meet deadlines
GS6. apply problem-solving approaches to different situations
GS7. analyse the business impact and disseminate relevant information to others
GS8. apply balanced judgments to different situations
GS9. check the work is complete and free from errors

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform data collection and analysis of data from mechatronic systems	10	10	-	6
PC1. Implement the identification and gathering of relevant data from sensors, actuators, PLCs, and SCADA systems within the mechatronic setup, ensuring data accuracy, completeness, and preprocessing to handle noise and missing values.	3	2	-	2
PC2. Utilizing descriptive, predictive, and prescriptive analytics methods to process and analyze the data, extracting meaningful insights and identifying patterns, trends, and potential issues within the system.	3	4	-	2
PC3. Creation of clear and informative visualizations, dashboards, and reports to present the analyzed data, highlighting key insights, performance metrics, and recommendations for system optimization and decision-making.	4	4	-	2
Develop and integrate control algorithms to establish feedback loops	15	15	-	10
PC4. Develop control algorithms based on system requirements and data insights, ensuring they effectively manage and adjust system operations in response to real-time data.	5	5	-	3

PC5. Integrate these control algorithms into the mechatronic system, establishing robust feedback loops that allow for dynamic adjustments to operational parameters to maintain optimal performance.	5	5	-	3
PC6. Perform rigorous testing and validation of the control algorithms and feedback loops to ensure they function correctly under various conditions, making necessary adjustments to enhance reliability and effectiveness.	5	5	-	4

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform post-Control integration activities for continuous improvement.	15	15	-	4
PC7. Perform continuous monitoring of the integrated control systems and feedback loops, using real-time data to track performance and identify any deviations from desired operating conditions	5	5	-	1
PC8. Conduct regular analysis of performance data to detect trends, anomalies, and areas for improvement, leveraging advanced analytics tools and techniques.	3	3		1
PC9. Applying of insights gained from performance analysis to refine and optimize control algorithms and system parameters, ensuring ongoing enhancements to system efficiency and reliability.	3	3	-	1
PC10. Prepare detailed documentation of all improvements and adjustments made, and effectively communicate these changes to relevant stakeholders to ensure transparency and alignment with operational goals, availability.	4	4	-	1
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N
NOS Name	Perform the Data Analytics motion on the retrieved data from the mechatronic systems and perform control feedback process.
Sector	Capital Goods
Sub-Sector	1. Plant Machinery 2. Robotics System Integration
Occupation	Design and Development
NSQF Level	6
Credits	4
Version	1.0
Last Reviewed Date	
Next Review Date	
NSQC Clearance Date	

CSC/N: Design the panels using CAD tools allowing proper tolerance and dimensions for individual components.

Description

This unit is about to Design the panels using CAD tools allowing proper tolerance and dimensions for individual components.

Scope

The scope covers the following:

- Identify, selection and placement of appropriate components for the panel design
- Implementation of proper tolerances & dimension management of panel components in CAD design
- Integration of functional features into the panel design.

Elements and Performance Criteria

▫ ▫ *Identify, selection and placement of appropriate components for the panel design.*

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

PC1. Analyze the functional requirements and environmental conditions of the panel system, including voltage ratings, current loads, and temperature specifications.

PC2. Conduct thorough research to identify suitable components such as circuit breakers, contactors, relays, and indicators, considering factors like performance, compatibility, and industry standards. Evaluate the components based on technical specifications, reliability, availability, and cost-effectiveness.

PC3. Integrate components into design by utilizing CAD tools to accurately place and arrange selected components within the panel enclosure, ensuring efficient use of space, proper wiring layout, and accessibility for maintenance and troubleshooting.

▫▫ *Implementation of proper tolerances & dimension management of panel components in CAD design*

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

PC4. Analyze engineering drawings, specifications, and standards to determine the required tolerances for panel components. Grasp the implications of tolerance stack-up and how it affects the overall fit and function of the panel assembly.

PC5. Utilize CAD software tools to perform tolerance analysis, ensuring that components fit together properly and meet design specifications. Adjust component dimensions and tolerances iteratively to optimize the overall assembly and account for manufacturing variations.

PC6. Conduct virtual simulations and interference checks within the CAD environment to verify that components align correctly and function as intended. Iterate the design based on simulation results to achieve the desired level of tolerance and dimensional accuracy in the final panel assembly.

- *Integration of functional features into the panel design*

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

PC7. Gather requirements from stakeholders and specifications to determine the necessary functional features such as cable entry points, ventilation systems, and mounting provisions for additional equipment.

PC8.Design the functional features seamlessly into the panel design, ensuring they meet operational needs while maintaining safety, accessibility, and compliance with relevant standards and regulations.

PC9. Integrate functional features into the panel design, allowing for precise placement and alignment of components such as cable glands, ventilation louvers, and mounting brackets.

PC10. Perform virtual simulations and 3D modeling within the CAD environment to validate the integration of functional features, ensuring they do not interfere with other components and contribute to the overall functionality and efficiency of the panel system.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation procedures for health, safety and security, individual role and responsibilities in this context

KU2. the organisation's emergency procedures for different emergency situations and the importance of following the same

KU3. CAD Software Proficiency: Proficiency in CAD software tools such as AutoCAD, SolidWorks, or Fusion 360, including knowledge of 2D and 3D modeling techniques, drawing tools, and assembly features.

KU4. Engineering Drawing Standards: Familiarity with engineering drawing standards such as ASME Y14.5, including knowledge of dimensioning practices, tolerancing standards, and symbols used in technical drawings.

KU5. Component Specifications: Understanding of specifications for electrical and mechanical components commonly used in panel design, including dimensions, mounting requirements, and operational parameters.

KU6. Tolerance Analysis Techniques: Knowledge of tolerance analysis methods, including geometric dimensioning and tolerancing (GD&T) principles, to ensure proper fit and function of components within the panel assembly.

KU7 Manufacturing Processes: Awareness of manufacturing processes and constraints relevant to panel fabrication, such as sheet metal bending, machining, and welding, and their implications for component tolerances and dimensions.

KU8. Quality Control and Regulatory Standards: Understanding of quality control methods and inspection techniques to ensure compliance with design specifications and regulatory standards, including UL 508A for industrial control panels or IEC 61439 for low-voltage switchgear and control gear assemblies.

Generic Skills (GS)

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

GS1. follow instructions, guidelines, procedures, rules, and service level agreements
GS2. listen effectively and communicate information accurately
GS3. follow rule-based decision-making processes
GS4. make decisions on suitable courses
GS5. plan and organize the work to achieve targets and meet deadlines
GS6. apply problem-solving approaches to different situations
GS7. analyse the business impact and disseminate relevant information to others
GS8. apply balanced judgments to different situations
GS9. check the work is complete and free from errors

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Identify, selection and placement of appropriate components for the panel design	10	10	-	7
PC1. Analyze the functional requirements and environmental conditions of the panel system, including voltage ratings, current loads, and temperature specifications.	3	3	-	2
PC2. Conduct thorough research to identify suitable components such as circuit breakers, contactors, relays, and indicators, considering factors like performance, compatibility, and industry standards. Evaluate the components based on technical specifications, reliability, availability, and cost-effectiveness.	3	3	-	2
PC3. Integrate components into design by utilizing CAD tools to accurately place and arrange selected components within the panel enclosure, ensuring efficient use of space, proper wiring layout, and accessibility for maintenance and troubleshooting.	4	4	-	3
Implementation of proper tolerances & dimension management of panel components in CAD design	12	12	-	9
PC4. Analyze engineering drawings, specifications, and standards to determine the required tolerances for panel components. Grasp the implications of tolerance stack-up and how it affects the overall fit and function of the panel assembly.	4	4	-	3
PC5. Utilize CAD software tools to perform tolerance analysis, ensuring that components fit together properly and meet design specifications. Adjust component dimensions and tolerances iteratively to optimize the overall assembly and account for manufacturing variations.	4	4	-	3
PC6. Conduct virtual simulations and interference checks within the CAD environment to verify that components align correctly and function as intended. Iterate the design based on simulation results to achieve the desired level of tolerance and dimensional accuracy in the final panel assembly.	4	4	-	3

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
▫ *Integration of functional features into the panel design*	18	18	-	4
PC7. Gather requirements from stakeholders and specifications to determine the necessary functional features such as cable entry points, ventilation systems, and mounting provisions for additional equipment.	5	5	-	1
PC8. Design the functional features seamlessly into the panel design, ensuring they meet operational needs while maintaining safety, accessibility, and compliance with relevant standards and regulations.	5	5	-	1
PC9. Integrate functional features into the panel design, allowing for precise placement and alignment of components such as cable glands, ventilation louvers, and mounting brackets.	4	4	-	1
PC10. Perform virtual simulations and 3D modeling within the CAD environment to validate the integration of functional features, ensuring they do not interfere with other components and contribute to the overall functionality and efficiency of the panel system.	4	4	-	1
NOS Total	40	40	-	20

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N
NOS Name	Design the panels using CAD tools allowing proper tolerance and dimensions for individual components.
Sector	Capital Goods
Sub-Sector	1. Plant Machinery 2. Robotics System Integration
Occupation	Design and Development
NSQF Level	6
Credits	3
Version	1.0
Last Reviewed Date	
Next Review Date	
NSQC Clearance Date	

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) (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. In case of successfully passing only certain number of NOSs, the trainee is eligible to take

subsequent assessment on the balance NOS's to pass the Qualification Pack.

6. In case of unsuccessful completion, the trainee may seek reassessment on 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
CSC/N: Lead/Oversee the System integration of machines with PLC and SCADA system.	40	40	0	20	100	15
CSC/N: Perform the Data Analytics motion on the retrieved data from the mechatronic systems and perform control feedback process.	40	40	0	20	100	15
CSC/N: Design the panels using CAD tools allowing proper tolerance and dimensions for individual components	40	40	0	20	100	15
Perform process control, feedback, and automate the existing manual operations.	40	40	-	20	100	15
Set up advanced automation in mechatronics	40	40	-	20	100	15
Collaboratively coordinate with the team.	40	40	-	20	100	10
Maintain Health, Safety and Environment at workplace.	40	40	-	20	100	5

DGT/VSQ/N0104- Employability Skills (120 hours)	40	40	-	20	100	10
Total	**320**	**320**	**-**	**160**	**800**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
AMC	Annual Maintenance Contract
PPE	Personal Protective Equipment

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.