Qualification Pack

Multi Axis CNC Machine Engineer

QP Code: CSC/Q

Version: 1.0

NSQF Level: 6

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CSC/Q: Multi Axis CNC Machine Engineer

Brief Job Description

The Multi-Axis CNC Machinist is responsible for operating, programming, and maintaining multi-axis CNC machines to produce precision components. The role requires a high level of technical skill and attention to detail to ensure that all parts meet stringent quality standards.

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: Perform CNC Machine Setup & Operation.**
2. **CSC/N: Selection and installation of cutting tools for multi-axis machining.**
3. **CSC/N: Perform Inspection methods and techniques for verifying part dimensions and tolerances.**

Qualification Pack (QP) Parameters

Sector	Capital Goods
Sub-Sector	1. Machining 2. Welding 3. Manufacturing
Occupation	Machining
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: Perform CNC Machine Setup & Operation

Brief Job Description

This NOS unit is about to Perform CNC Machine Setup & Operation.

Scope

The scope covers the following:

- Perform Setup of CNC Machines with reading blueprints, tool selection & installation, machine calibration.
- Implement operation of CNC Machines with machine programming and execution.
- Conduct quality control and regular maintenance, troubleshoot any operational issues.

Elements and Performance Criteria

Perform Setup of CNC Machines with reading blueprints, tool selection & installation, machine calibration.

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

PC1. identify and interpret technical drawings and blueprints to determine the specifications and requirements. And develop a clear plan for the setup process based on the information obtained from the blueprints.

PC2. Select the correct cutting tools and attachments for the specific machining task and install them accurately. And perform tool configuration to ensure that tools are correctly positioned.

PC3. Perform calibration of CNC machine's settings, including axis movements, spindle speeds, and feed rates, to match the job requirements and perform test runs.

Implement operation of CNC Machines with machine programming and execution.

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

PC4. Develop and edit CNC programs using CAD/CAM software to generate the required G-code and M-code. Input the CNC programs into the machine's control system and verify their correctness.

PC5. Execute the Machining Process, load raw materials or workpieces into the machine, ensuring they are securely fastened. Continuously monitor machine operations to ensure they run smoothly

PC6. Conduct Regular Inspections with use of precision measuring tools (e.g., calipers, micrometers, gauges) Keep detailed records of the machining process, including any adjustments made and inspection results, and report any significant issues or deviations to the appropriate personnel for further analysis.

Conduct quality control and regular maintenance, troubleshoot any operational issues.

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

PC7. Conduct Thorough Quality Control by having detailed inspections of machined parts using precision measuring tools to ensure they meet all specified tolerances and quality standards.

PC8. Perform scheduled maintenance tasks such as cleaning, lubrication, and parts replacement to keep CNC machines in optimal working condition.

PC9.Implement & quickly diagnose operational issues with CNC machines, such as mechanical failures, programming errors, or tool wear, using troubleshooting techniques and diagnostic tools.

PC10. Maintain comprehensive records of all maintenance activities, including dates, tasks performed, parts replaced, and any issues encountered.

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. Technical Documentation and Blueprint Interpretation: A deep understanding of Blueprint Reading i.e. to read and interpret technical drawings, blueprints, and job orders to extract necessary information such as dimensions, tolerances, and material specifications. The basics of CAD/CAM software used for creating and modifying CNC programs, and how to convert design specifications into machine-readable code.

KU4. CNC Machine Programming: Understanding of fundamentals of G-code and M-code, including common commands and how they control the machine's movements and operations. Techniques for optimizing CNC programs to enhance efficiency, reduce cycle times, and improve part quality.

KU4. Tooling and Fixtures: Implement criteria for selecting appropriate cutting tools, fixtures, and attachments based on the material and machining requirements. Procedures for correctly installing and securing tools and fixtures in the CNC machine.

KU5. Machine Setup and Calibration: Methods for aligning the machine components, including the spindle, table, and workpiece, to ensure precise machining. Step-by-step procedures for setting up CNC machines, including loading and securing workpieces, setting zero points, and configuring machine parameters. Techniques for calibrating the machine to ensure it operates within specified tolerances and produces accurate parts.

KU6. Machining Operations: Understanding of Procedures for safely and effectively loading and unloading materials and workpieces. Monitoring the machining process, including observing tool wear, chip formation, and machine sounds to detect potential issues. Techniques for making real-time adjustments to machine settings, such as feed rates and spindle speeds, to maintain optimal performance and quality.

KU7. Maintenance and Troubleshooting: Knowledge of Procedures for performing routine maintenance tasks, such as cleaning, lubrication, and parts replacement, to keep machines in optimal working condition. Methods for diagnosing and resolving common operational issues, including mechanical failures,

programming errors, and tool wear.

KU8. Safety Protocols: Knowledge of workplace safety protocols and procedures, including the use of personal protective equipment (PPE) and safe handling of materials and tools. Ability to identify potential safety hazards in the machining environment and take appropriate measures to mitigate them.

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
Perform Setup of CNC Machines with reading blueprints, tool selection & installation, machine calibration	10	10	-	6
PC1. Identify and interpret technical drawings and blueprints to determine the specifications and requirements. And develop a clear plan for the setup process based on the information obtained from the blueprints.	3	2	-	2
PC2. Select the correct cutting tools and attachments for the specific machining task and install them accurately. And perform tool configuration to ensure that tools are correctly positioned.	3	4	-	2
PC3. Perform calibration of CNC machine's settings, including axis movements, spindle speeds, and feed rates, to match the job requirements and perform test runs	4	4	-	2
Implement operation of CNC Machines with machine programming and execution	15	15	-	10
PC4. Develop and edit CNC programs using CAD/CAM software to generate the required G-code and M-code. Input the CNC programs into the machine's control system and verify their correctness.	5	5	-	3
PC5. Execute the Machining Process, load raw materials or workpieces into the machine, ensuring they are securely fastened. Continuously monitor machine operations to ensure they run smoothly.	5	5	-	3
PC6.Conduct Regular Inspections with use of precision measuring tools (e.g., calipers, micrometers, gauges) Keep detailed records of the machining process, including any adjustments made and inspection results, and report any significant issues or deviations to the appropriate personnel for further analysis	5	5	-	4

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Conduct quality control and regular maintenance, troubleshoot any operational issues	15	15	-	4
PC7. Conduct Thorough Quality Control by having detailed inspections of machined parts using precision measuring tools to ensure they meet all specified tolerances and quality standards.	5	4	-	1
PC8. Perform scheduled maintenance tasks such as cleaning, lubrication, and parts replacement to keep CNC machines in optimal working condition.	4	3	-	1
PC9. Implement & quickly diagnose operational issues with CNC machines, such as mechanical failures, programming errors, or tool wear, using troubleshooting techniques and diagnostic tools.	3	4	-	1
PC10. Maintain comprehensive records of all maintenance activities, including dates, tasks performed, parts replaced, and any issues encountered.	3	4		1
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N
NOS Name	Perform CNC Machine Setup & Operation
Sector	Capital Goods
Sub-Sector	1. Machining 2. Welding 3. Manufacturing
Occupation	Machining
NSQF Level	6
Credits	3
Version	1.0
Last Reviewed Date	
Next Review Date	
NSQC Clearance Date	

CSC/N: Selection and installation of cutting tools for multi-axis machining

Description

This unit is about the selection and installation of cutting tools for multi-axis machining involve choosing appropriate tools based on material, geometry, and machining parameters, then precisely installing them to ensure optimal performance and accuracy.

Scope

The scope covers the following:

- Identify cutting tools based on the material being machined, desired surface finish.
- Conduct precisely installation of cutting tools in the machine spindle
- Perform initial testing and optimization of tool paths and cutting parameters to validate tool performance.

Elements and Performance Criteria

▫▫ *Identify cutting tools based on the material being machined, desired surface finish*

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

PC1. Analyze the properties of the material to be machined, such as hardness, toughness, and thermal conductivity, to select cutting tools that can handle the specific characteristics of the material without excessive wear.

PC2. Determine the desired surface finish and tolerances for the final product, choosing cutting tools with the appropriate geometry, edge sharpness, and coating to achieve the required surface quality.

PC3. Select the cutting tool materials (e.g., high-speed steel, carbide, ceramics) and coatings (e.g., TiN, TiAlN, diamond) that match the machining conditions and enhance tool life, performance, and the ability to achieve the desired finish.

▫▫ *Conduct precisely installation of cutting tools in the machine spindle*

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

PC4. Ensure cleaning the tool holder and spindle to remove any debris or contaminants that could affect tool alignment and stability. And handle the cutting tools carefully to avoid damage to the cutting edges and maintain their precision.

PC5. Align the cutting tool accurately in the spindle or tool holder using alignment tools or precision instruments to ensure correct positioning. Secure the tool tightly using the appropriate clamping mechanism (e.g., collet, chuck, or hydraulic tool holder) to prevent movement or slippage during machining operation

PC6. Verify tool setup by measuring runout and ensuring minimal deviation from the spindle axis to maintain accuracy. Perform a trial run or test cut to verify proper installation and make any necessary adjustments to achieve optimal performance and precision.

▫ ▫*Perform initial testing and optimization of tool paths and cutting parameters to validate tool performance*

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

PC7. Conduct initial test runs with the selected cutting tools and tool paths on a sample material to evaluate the basic performance, ensuring that the tool engages the material correctly without excessive vibration or deflection.

PC8. Analyze key cutting parameters such as spindle speed, feed rate, and depth of cut during the initial tests, observing the tool's behavior and the quality of the machined surface.

PC9. Monitor the condition of the cutting tools for signs of wear, chipping, or other issues, and inspect the workpiece for surface finish, dimensional accuracy, and potential defects.

PC10. Optimize & adjust the cutting parameters and tool paths based on the test results to enhance performance, achieving the desired balance between machining efficiency, tool life, and workpiece quality.

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. Tool Geometry and Application: Knowledge of different cutting tool geometries (e.g., end mills, drills, reamers) and their specific applications in multi-axis machining processes, including roughing, finishing, and profiling operations.

KU4. Material Compatibility and Machining Parameters: Understanding of how material properties (e.g., hardness, toughness, thermal conductivity) influence tool selection and machining parameters such as cutting speed, feed rate, and depth of cut.

KU5. Tool Holder and Spindle Interface: Familiarity with various types of tool holders (e.g., collets, chucks, hydraulic holders) and spindle interfaces (e.g., HSK, CAT, BT) used in multi-axis machining centers, including their features, benefits, and limitations.

KU6. Installation Procedures: Knowledge of proper procedures for installing cutting tools in tool holders and securing them in the machine spindle, including techniques for achieving precise tool alignment and clamping force.

KU7. Tool Wear and Failure Modes: Understanding of common wear mechanisms (e.g., flank wear, chipping, edge deformation) and failure modes experienced by cutting tools during multi-axis machining operations, and strategies for mitigating them.

KU8. Tool Maintenance and Replacement: Awareness of maintenance practices to prolong tool life, such as regular inspection, cleaning, and tool reconditioning, as well as criteria for determining when to replace worn or damaged tools to maintain machining quality and productivity.

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 cutting tools based on the material being machined, desired surface finish	10	10	-	6
PC1. Analyze the properties of the material to be machined, such as hardness, toughness, and thermal conductivity, to select cutting tools that can handle the specific characteristics of the material without excessive wear.	3	2	-	2
PC2. Determine the desired surface finish and tolerances for the final product, choosing cutting tools with the appropriate geometry, edge sharpness, and coating to achieve the required surface quality.	3	4	-	2
PC3. Select the cutting tool materials (e.g., high-speed steel, carbide, ceramics) and coatings (e.g., TiN, TiAlN, diamond) that match the machining conditions and enhance tool life, performance, and the ability to achieve the desired finish.	4	4	-	2
Conduct precisely installation of cutting tools in the machine spindle	15	15	-	10
PC4. Ensure cleaning the tool holder and spindle to remove any debris or contaminants that could affect tool alignment and stability. And handle the cutting tools carefully to avoid damage to the cutting edges and maintain their precision.	5	5	-	3

PC5. Align the cutting tool accurately in the spindle or tool holder using alignment tools or precision instruments to ensure correct positioning. Secure the tool tightly using the appropriate clamping mechanism (e.g., collet, chuck, or hydraulic tool holder) to prevent movement or slippage during machining operation.	5	5	-	3
PC6. Verify tool setup by measuring runout and ensuring minimal deviation from the spindle axis to maintain accuracy. Perform a trial run or test cut to verify proper installation and make any necessary adjustments to achieve optimal performance and precision.	5	5	-	4

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform initial testing and optimization of tool paths and cutting parameters to validate tool performance.	15	15	-	4
PC7. Conduct initial test runs with the selected cutting tools and tool paths on a sample material to evaluate the basic performance, ensuring that the tool engages the material correctly without excessive vibration or deflection.	5	5	-	1
PC8. Analyze key cutting parameters such as spindle speed, feed rate, and depth of cut during the initial tests, observing the tool's behavior and the quality of the machined surface.	3	3		1
PC9. Monitor the condition of the cutting tools for signs of wear, chipping, or other issues, and inspect the workpiece for surface finish, dimensional accuracy, and potential defects.	3	3	-	1
PC10. Optimize & adjust the cutting parameters and tool paths based on the test results to enhance performance, achieving the desired balance between machining efficiency, tool life, and workpiece quality.	4	4	-	1
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N
NOS Name	Selection and installation of cutting tools for multi-axis machining
Sector	Capital Goods
Sub-Sector	1. Machining 2. Welding 3. Manufacturing
Occupation	Machining
NSQF Level	6
Credits	5
Version	1.0
Last Reviewed Date	
Next Review Date	
NSQC Clearance Date	

CSC/N: Perform Inspection methods and techniques for verifying part dimensions and tolerances.

Description

This unit is about the Inspection methods for verifying part dimensions and tolerances include traditional dimensional measurement tools like callipers and micrometres, as well as advanced techniques such as coordinate measuring machines (CMMs) and optical measurement systems, ensuring accuracy and compliance with specifications.

Scope

The scope covers the following:

- Identify & selection of Appropriate Measurement Tools
- Implementation of standardized inspection procedures, including setup of measurement equipment.
- Analysis of inspection data to verify part dimensions and tolerances against engineering drawings.

Elements and Performance Criteria

▫ ▫ *Identify & selection of Appropriate Measurement Tools.*

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

PC1. Assess the geometry, material, and tolerances of the part to be measured, considering factors such as size, shape, surface finish, and dimensional complexity.

PC2. Identify suitable measurement tools and techniques based on the specific features and dimensions of the part, selecting tools such as calipers, micrometers, height gauges, CMMs, or optical measurement systems.

PC3. Evaluate the required level of accuracy and precision for the measurement task, choosing measurement tools with appropriate resolution and sensitivity to ensure accurate and reliable results.

▫▫*Implementation of standardized inspection procedures, including setup of measurement equipment*

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

PC4. Perform standardized inspection protocols established for the specific type of parts or components being inspected, including procedures for setup, measurement, and documentation.

PC5. Ensure the set-up measurement equipment according to prescribed procedures, including calibration checks and adjustments to ensure accuracy and repeatability.

PC6. Implement compliance with safety protocols and quality standards during equipment setup and inspection activities, prioritizing the safety of personnel and the accuracy of inspection results.

- *Analysis of inspection data to verify part dimensions and tolerances against engineering drawings*

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

PC7. Interpret engineering drawings and specifications accurately to understand the required part dimensions, tolerances, and geometric features specified by the design.

PC8. Collect measurement data from inspection activities using appropriate tools and techniques, ensuring accuracy and consistency in data collection.

PC9. Perform comparison of the measured dimensions and tolerances obtained from inspection data with the corresponding values specified in the engineering drawings, identifying any deviations or discrepancies.

PC10. Analyze the inspection data comprehensively to determine whether the measured dimensions and tolerances fall within acceptable limits defined by the engineering drawings.

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. Measurement Tools and Equipment: Familiarity with a variety of measurement tools and equipment such as calipers, micrometers, height gauges, CMMs, optical comparators, and surface profilometers, including their principles of operation and applications.

KU4. Engineering Drawings and Specifications: Interpretation of engineering drawings, geometric dimensioning and tolerancing (GD&T) symbols, and specifications to comprehend the required part dimensions, tolerances, and geometric features.

KU5. Measurement Techniques and Procedures: Knowledge of measurement techniques and procedures for accurately capturing part dimensions and features, including proper handling of measurement tools, alignment techniques, and measurement uncertainty considerations.

KU6. Tolerance Analysis and Verification: Understanding of tolerance analysis methods and statistical techniques for verifying part dimensions and tolerances against specified limits, including the interpretation of measurement data and identification of deviations.

KU7 Quality Standards and Inspection Protocols: Awareness of quality standards and inspection protocols relevant to the industry, such as ISO 9001, AS9100, or automotive industry standards, and adherence to standardized inspection procedures for consistency and repeatability.

KU8. Data Analysis and Reporting: Analyze inspection data systematically, interpret measurement results, and generate comprehensive reports documenting inspection findings, including identification of non-conformities and recommendations for corrective actions.

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 of Appropriate Measurement Tools	10	10	-	7
PC1. Assess the geometry, material, and tolerances of the part to be measured, considering factors such as size, shape, surface finish, and dimensional complexity.	3	3	-	2
PC2. Identify suitable measurement tools and techniques based on the specific features and dimensions of the part, selecting tools such as calipers, micrometers, height gauges, CMMs, or optical measurement systems.	3	3	-	2
PC3. Evaluate the required level of accuracy and precision for the measurement task, choosing measurement tools with appropriate resolution and sensitivity to ensure accurate and reliable results.	4	4	-	3
Implementation of standardized inspection procedures, including setup of measurement equipment	12	12	-	9
PC4. Perform standardized inspection protocols established for the specific type of parts or components being inspected, including procedures for setup, measurement, and documentation	4	4	-	3
PC5. Ensure the set-up measurement equipment according to prescribed procedures, including calibration checks and adjustments to ensure accuracy and repeatability	4	4	-	3
PC6. Implement compliance with safety protocols and quality standards during equipment setup and inspection activities, prioritizing the safety of personnel and the accuracy of inspection results.	4	4	-	3

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Analysis of inspection data to verify part dimensions and tolerances against engineering drawings	18	18	-	4
PC7. Interpret engineering drawings and specifications accurately to understand the required part dimensions, tolerances, and geometric features specified by the design.	5	5	-	1
PC8. Collect measurement data from inspection activities using appropriate tools and techniques, ensuring accuracy and consistency in data collection.	5	5	-	1
PC9. Perform comparison of the measured dimensions and tolerances obtained from inspection data with the corresponding values specified in the engineering drawings, identifying any deviations or discrepancies	4	4	-	1
PC10. Analyze the inspection data comprehensively to determine whether the measured dimensions and tolerances fall within acceptable limits defined by the engineering drawings.	4	4	-	1
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N
NOS Name	Perform Inspection methods and techniques for verifying part dimensions and tolerances.
Sector	Capital Goods
Sub-Sector	1. Machining 2. Welding 3. Manufacturing
Occupation	Machining
NSQF Level	6
Credits	7
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: Perform CNC Machine Setup &Operation	40	40	0	20	100	25
CSC/N: Selection and installation of cutting tools for multi-axis machining	40	40	0	20	100	25
CSC/N: Perform Inspection methods and techniques for verifying part dimensions and tolerances.	40	40	0	20	100	20
Collaboratively coordinate with the team.	40	40	-	20	100	10
Maintain Health, Safety and Environment at workplace.	40	40	-	20	100	10
DGT/VSQ/N0103- Employability Skills (90 hours)	40	40	-	20	100	10
Total	**240**	**240**	**-**	**120**	**600**	**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.