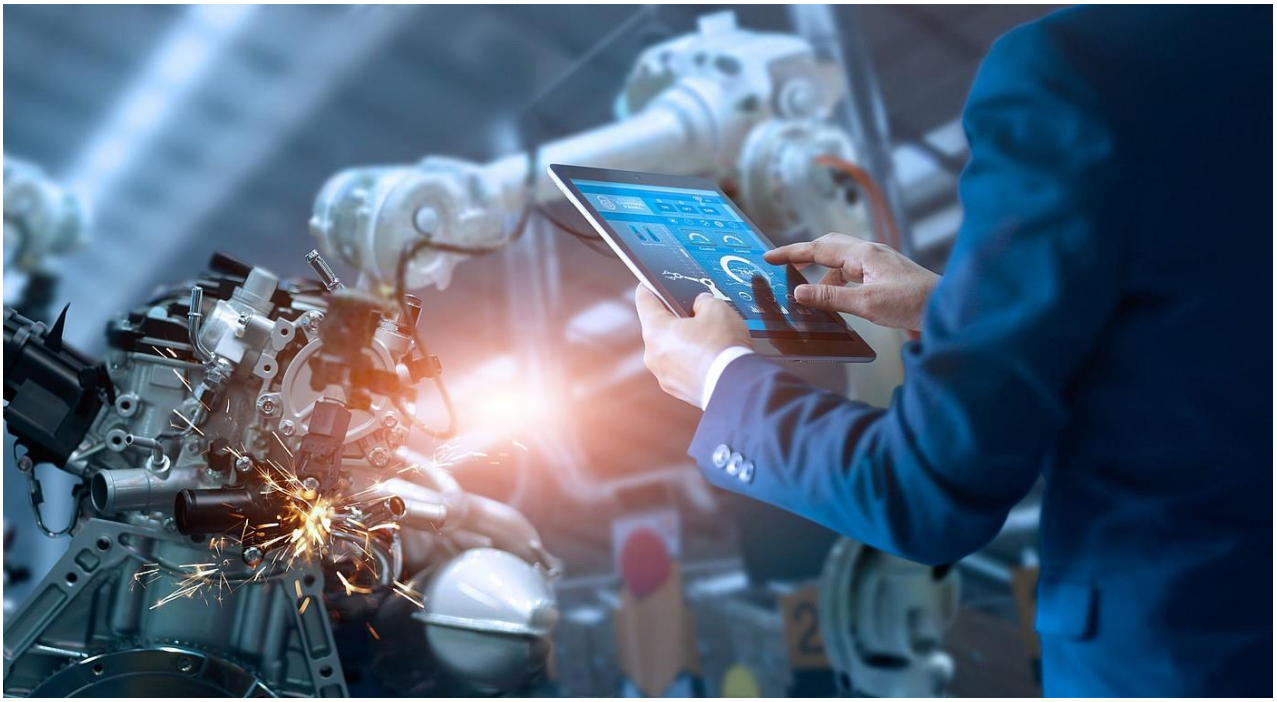
Qualification Pack



Automated / Robotic Metal Fabrication Engineer

QP Code: CSC/Q

Version: 1.0

NSQF Level: 6

Capital Goods and Strategic Skill Council || 1st Floor, L-29,Outer Circle, Connaught Place New Delhi - 110001 Email: coo@cgsc.in

Contents

Automated/ Robotic Metal Fabrication Engineer

Brief Job Description

The Automated/Robotic Metal Fabricator operates and maintains CNC machines and robotic welders to fabricate metal components, ensuring quality and adherence to specifications while prioritizing safety and continuous improvement

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: Setting up robotic work cells and automated fixtures for specific fabrication processes.**
2. **CSC/N : Select and Prepare metal materials for fabrication processes**
3. **CSC/N: Inspect for Dimensional Defects by implementing process optimization strategies.**

Qualification Pack (QP) Parameters

Sector	Capital Goods
Sub-Sector	1. Machining 2. Welding 3. Manufacturing
Occupation	Fitting, Fabrication and Assembly
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: Setting up robotic work cells and automated fixtures for specific fabrication processes.

Brief Job Description

This NOS unit is about to setting up robotic work cells and automated fixtures for specific fabrication processes.

Scope

The scope covers the following:

- Select robotic work cells and automated fixtures streamlines fabrication processes, enhancing efficiency and precision.
- Ensure consistent quality in production by minimizing errors and variations through the utilization of these advanced systems.
- Optimize workflow and adapt to evolving manufacturing needs.

Elements and Performance Criteria

▫▫ Select robotic work cells and automated fixtures streamlines fabrication processes, enhancing efficiency and precision

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

PC1. Analyze the fabrication process to identify tasks suitable for automation, considering factors like repeatability, complexity, and safety requirements.

PC2. Choose robotic systems based on the required payload capacity, reach, speed, and accuracy to effectively perform the identified tasks.

PC3 Design automated fixtures tailored to the specific parts and processes, ensuring secure clamping, alignment, and accessibility for robotic manipulation.

▫▫ Ensure consistent quality in production by minimizing errors and variations through the utilization of these advanced systems

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

PC4. Develop robot programs to execute tasks accurately and efficiently, integrating sensors and vision systems for real-time feedback and adaptive control.

PC5. Implement safety measures such as barriers, interlocks, and light curtains to protect personnel and equipment from potential hazards associated with automated operations

PC6. Incorporate inspection and testing systems within the work cell to monitor part quality and detect defects, ensuring consistency and compliance with specifications.

▫▫ *optimize workflow and adapt to evolving manufacturing needs*

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

PC7. Establish maintenance schedules and procedures to keep robotic systems and fixtures in optimal condition, minimizing downtime and ensuring reliable operation.

PC8. Design work cells and fixtures with modularity and flexibility to accommodate changes in production requirements and facilitate future expansions or reconfigurations.

PC9. Define performance metrics such as cycle time, throughput, and uptime to measure the efficiency and productivity of the automated fabrication processes.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Understand robot types, kinematics, and programming languages for effective integration. Learn automation technologies such as sensors, actuators, and controllers to optimize fabrication processes.

KU2. Grasp machining, welding, assembly, and material handling principles to identify automation opportunities. Implement robotic solutions within workflows for increased efficiency and productivity

KU3. Master fixture design concepts including clamping mechanisms, part locating features, and ergonomics. Develop fixtures ensuring secure workpiece holding and efficient robotic manipulation

KU4. Utilize CAD for fixture design and CAM for generating tool paths and robot programs. Ensure compatibility with robotic systems for seamless integration and operation.

KU5. Proficiently program robots and integrate them into manufacturing processes. Configure communication interfaces to facilitate seamless interaction with other equipment and systems.

KU6. Adhere to safety standards like ISO 10218 for industrial robots. Ensure compliance with regulations governing robotic work cell design and operation to prioritize personnel and equipment safety.

KU7. Implement quality control methods such as vision systems, coordinate measuring machines, and statistical process control to maintain part quality. Detect and address defects promptly for optimal production outcomes.

KU8. Establish maintenance procedures and predictive strategies to minimize downtime. Troubleshoot issues promptly to ensure smooth operation of robotic systems and fixtures

KU9. Commit to ongoing learning and improvement, staying updated with robotics and automation advancements. Utilize feedback and data analytics to enhance productivity, quality, and efficiency in fabrication processes.

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 robotic work cells and automated fixtures streamlines fabrication processes, enhancing efficiency and precision.	10	10	-	6
PC1. Analyze the fabrication process to identify tasks suitable for automation, considering factors like repeatability, complexity, and safety requirements.	3	2	-	2
PC2. Choose robotic systems based on the required payload capacity, reach, speed, and accuracy to effectively perform the identified tasks.	3	4	-	2
PC3. Design automated fixtures tailored to the specific parts and processes, ensuring secure clamping, alignment, and accessibility for robotic manipulation.	4	4	-	2
Ensure consistent quality in production by minimizing errors and variations through the utilization of these advanced systems	15	15	-	10
PC4. Develop robot programs to execute tasks accurately and efficiently, integrating sensors and vision systems for real-time feedback and adaptive control.	5	5	-	3
PC5. Implement safety measures such as barriers, interlocks, and light curtains to protect personnel and equipment from potential hazards associated with automated operations	5	5	-	3
PC6. Incorporate inspection and testing systems within the work cell to monitor part quality and detect defects, ensuring consistency and compliance with specifications	5	5	-	4

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Optimize workflow and adapt to evolving manufacturing needs.	15	15	-	4
PC7. Establish maintenance schedules and procedures to keep robotic systems and fixtures in optimal condition, minimizing downtime and ensuring reliable operation.	6	5	-	2
PC8. Design work cells and fixtures with modularity and flexibility to accommodate changes in production requirements and facilitate future expansions or reconfigurations	5	6	-	1
PC9. Define performance metrics such as cycle time, throughput, and uptime to measure the efficiency and productivity of the automated fabrication processes	4	5	-	1
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N
NOS Name	Setting up robotic work cells and automated fixtures for specific fabrication processes.
Sector	Capital Goods
Sub-Sector	1. 1. Machining 2. Welding 3.Manufacturing
Occupation	Fitting, Fabrication and Assembly
NSQF Level	6
Credits	3
Version	1.0
Last Reviewed Date	
Next Review Date	
NSQC Clearance Date	

CSC/N: Select and Prepare metal materials for fabrication processes

Description

This unit is about to Select and Prepare metal materials for fabrication processes

Scope

The scope covers the following:

- Prioritize material traits for process suitability and end-use requirements.
- Apply cutting-edge techniques for precise material shaping and preparation
- Ensuring dimensional accuracy, metallurgical integrity, and adherence to standards through inspections and documentation.

Elements and Performance Criteria

▫▫ *Prioritize material traits for process suitability and end-use requirements*

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

PC1.Identify performance requirements encompassing mechanical, thermal, and chemical properties crucial for the application's demands. Evaluate metals based on criteria such as strength, ductility, and cost-effectiveness to determine the most suitable materials for fabrication processes.

PC2. Thoroughly clean metal surfaces to eliminate contaminants like oil, grease, and rust, ensuring optimal adhesion and quality in subsequent fabrication steps. Utilize various methods such as degreasing, pickling, or sandblasting to achieve pristine surface conditions

PC3. Maintain precise dimensional accuracy during cutting and shaping processes to meet design specifications effectively.

▫▫ *Apply cutting-edge techniques for precise material shaping and preparation*

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

PC4. Employ processes such as annealing, quenching, or tempering to modify material properties as required for fabrication.

PC5. Consider factors such as texture, smoothness, and reflectivity when selecting surface finishing methods for metal materials.

PC6. Choose corrosion-resistant materials or employ surface treatments such as galvanization or anodizing to prevent rusting and degradation.

▫ *Ensuring dimensional accuracy, metallurgical integrity, and adherence to standards through inspections and documentation.*

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

PC7. Conduct comprehensive inspections and testing procedures, including visual inspection, hardness testing, and non-destructive testing, to verify material quality and integrity.

PC8. Establish robust record-keeping systems to track materials from procurement through fabrication, enabling effective quality management and troubleshooting.

PC9, Emphasize continuous process improvement by soliciting feedback, analyzing performance metrics, and identifying areas for optimization.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. **Material Properties:** Knowledge of mechanical properties such as tensile strength, yield strength, hardness, and ductility is crucial to ensure that the selected material can withstand the intended loads and stresses encountered during fabrication and in service

KU2. **Corrosion Resistance:** Understanding the environmental conditions to which the fabricated component will be exposed helps in selecting materials with appropriate corrosion resistance properties, thus ensuring longevity and performance.

KU3. **Fabrication Techniques:** Familiarity with different fabrication methods such as welding, machining, forming, and casting enables the selection of materials that can be effectively processed using the chosen techniques, ensuring ease of fabrication and high-quality results.

KU4. **Cost Considerations:** Knowledge of material costs and availability allows for the selection of materials that meet performance requirements while staying within budget constraints, optimizing cost-effectiveness.

KU5. **Application Requirements:** Understanding the specific functional and aesthetic requirements of the fabricated component guides the selection of materials with the right combination of properties to meet those needs, ensuring that the final product performs as intended.

KU6. **Material Standards and Specifications:** Familiarity with industry standards and material specifications helps in selecting materials that comply with regulatory requirements and quality standards, ensuring the reliability and safety of the fabricated components.

KU7. **Environmental and Sustainability Factors:** Awareness of environmental regulations, recycling capabilities, and sustainability goals influences material selection decisions, leading to the use of eco-friendly materials and processes that minimize environmental impact.

KU8. **Supplier and Supply Chain Considerations:** Knowledge of material suppliers, their reliability, and the stability of the supply chain ensures consistent access to quality materials, reducing the risk of production delays or disruptions.
Improvement.

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
Prioritize material traits for process suitability and end-use requirements.	10	10	-	6
PC1. Identify performance requirements encompassing mechanical, thermal, and chemical properties crucial for the application's demands. Evaluate metals based on criteria such as strength, ductility, and cost-effectiveness to determine the most suitable materials for fabrication processes.	3	2	-	2
PC2. Thoroughly clean metal surfaces to eliminate contaminants like oil, grease, and rust, ensuring optimal adhesion and quality in subsequent fabrication steps. Utilize various methods such as degreasing, pickling, or sandblasting to achieve pristine surface conditions	3	4	-	2
PC3. Maintain precise dimensional accuracy during cutting and shaping processes to meet design specifications effectively.	4	4	-	2
Apply cutting-edge techniques for precise material shaping and preparation	15	15	-	10
PC4. Employ processes such as annealing, quenching, or tempering to modify material properties as required for fabrication.	5	5	-	3
PC5. Consider factors such as texture, smoothness, and reflectivity when selecting surface finishing methods for metal materials	5	5	-	3
PC6.select and install the suitable network protocols like MODBUS,CC-LINK, Profinet, Profibus, OPC UA, MQTT etc. based on control system requirements.	5	5	-	4

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform post-System integration activities.	15	15	-	4
PC7. Conduct comprehensive inspections and testing procedures, including visual inspection, hardness testing, and non-destructive testing, to verify material quality and integrity.	6	5	-	2
PC8. Establish robust record-keeping systems to track materials from procurement through fabrication, enabling effective quality management and troubleshooting.	5	5		1
PC9. Emphasize continuous process improvement by soliciting feedback, analyzing performance metrics, and identifying areas for optimization.	4	5	-	1
NOS Total	40	40	-	20

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N
NOS Name	**Select and Prepare metal materials for fabrication processes**
Sector	Capital Goods
Sub-Sector	1. Machining 2. Welding 3. Manufacturing
Occupation	Fitting, Fabrication and Assembly
NSQF Level	6
Credits	5
Version	1.0
Last Reviewed Date	
Next Review Date	
NSQC Clearance Date	

.CSC/N: Inspect for Dimensional Defects by implementing process optimization strategies

Description

- This unit is about to Inspect for Dimensional Defects by implementing process optimization strategies

Scope

The scope covers the following:

- Identifying dimensional discrepancies in fabricated components through thorough inspection processes.
- Implementing strategies to enhance fabrication methods, including adjusting parameters, refining tooling, or improving workflow efficiencies, to minimize dimensional defects.
- Iteratively refining optimization strategies based on inspection findings and feedback to continually reduce dimensional defects and enhance overall fabrication quality and efficiency

Elements and Performance Criteria

identifying dimensional discrepancies in fabricated components through thorough inspection processes.

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

PC1. Employ precise measurement tools to accurately detect dimensional discrepancies, ensuring compliance with specified tolerances and standards.

PC2. Analyze fabrication processes meticulously to identify inefficiencies and areas for improvement, aiming to enhance dimensional accuracy and minimize defects.

PC3. Establish robust inspection protocols to comprehensively examine components for dimensional defects, maintaining consistency and reliability in defect detection.

implementing strategies to enhance fabrication methods, including adjusting parameters, refining tooling, or improving workflow efficiencies, to minimize dimensional defects

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

PC4. Utilize advanced data analysis techniques to assess inspection results, extract insights, and refine optimization strategies accordingly.

PC5. Provide comprehensive training on measurement techniques and result interpretation, facilitating effective communication of findings and optimization recommendations across teams.

PC6. Maintain meticulous records documenting inspection outcomes, optimization activities, and corrective measures, ensuring traceability and accountability.

iteratively refining optimization strategies based on inspection findings and feedback to continually reduce dimensional defects and enhance overall fabrication quality and efficiency

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

PC7. Develop and monitor key performance indicators such as defect rates and process capability indices, leveraging insights to drive continuous improvement efforts.

PC8. Foster collaboration between inspection and optimization teams, integrating their efforts to achieve synergistic improvements in dimensional defect prevention.

PC9. Remain adaptable to evolving process requirements and technological advancements, continually refining inspection and optimization strategies for sustained effectiveness.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Proficiency in using measurement tools and methods to accurately assess dimensional attributes and detect defects

KU2. Understanding of the fabrication processes involved and how variations in parameters can affect dimensional accuracy.

KU3. Familiarity with inspection protocols, standards, and quality control measures to ensure thorough examination and compliance with specifications.

KU4. Ability to analyse inspection data effectively, identify trends, and derive insights to guide process optimization efforts.

KU5. Capability to troubleshoot dimensional defects, analyze root causes, and develop targeted solutions for improvement.

KU6. Collaboration with cross-functional teams to integrate inspection and optimization efforts, leveraging diverse expertise for holistic improvement.

KU7. Commitment to ongoing learning, adaptation to technological advancements, and proactive pursuit of optimization opportunities for sustained enhancement of fabrication processes.

KU8. Proficiency in maintaining detailed records of inspection results, optimization activities, and performance metrics to track progress and facilitate decision-making.

KU9. Ability to communicate findings, recommendations, and progress effectively to stakeholders, fostering alignment and support for optimization initiatives.

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
Identifying dimensional discrepancies in fabricated components through thorough inspection processes.	10	10	-	7
PC1.Employ precise measurement tools to accurately detect dimensional discrepancies, ensuring compliance with specified tolerances and standards.	3	3	-	2
PC2. Analyze fabrication processes meticulously to identify inefficiencies and areas for improvement, aiming to enhance dimensional accuracy and minimize defects	3	3	-	2
PC3. Establish robust inspection protocols to comprehensively examine components for dimensional defects, maintaining consistency and reliability in defect detection	4	4	-	3
implementing strategies to enhance fabrication methods, including adjusting parameters, refining tooling, or improving workflow efficiencies, to minimize dimensional defects	15	15	-	9
PC4. Utilize advanced data analysis techniques to assess inspection results, extract insights, and refine optimization strategies accordingly.	5	5	-	3
PC5. Provide comprehensive training on measurement techniques and result interpretation, facilitating effective communication of findings and optimization recommendations across teams.	5	5	-	3
PC6. Maintain meticulous records documenting inspection outcomes, optimization activities, and corrective measures, ensuring traceability and accountability	5	5	-	3

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
iteratively refining optimization strategies based on inspection findings and feedback to continually reduce dimensional defects and enhance overall fabrication quality and efficiency	15	15	-	4
PC7. Develop and monitor key performance indicators such as defect rates and process capability indices, leveraging insights to drive continuous improvement efforts.	5	5	-	2
PC8. Foster collaboration between inspection and optimization teams, integrating their efforts to achieve synergistic improvements in dimensional defect prevention.	5	5	-	1
PC9. Remain adaptable to evolving process requirements and technological advancements, continually refining inspection and optimization strategies for sustained effectiveness.	5	5	-	1
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N
NOS Name	Inspect for Dimensional Defects by Implementing process optimization strategies
Sector	Capital Goods
Sub-Sector	1. Machining 2. Welding 3. Manufacturing
Occupation	Fitting, Fabrication and Assembly
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: Setting up robotic work cells and Automated fixtures for specific fabrication processes	40	40	0	20	100	25
CSC/N : Select and Prepare metal materials for fabrication processes	40	40	0	20	100	25
CSC/N: Inspect for Dimensional Defects by Implementing process optimization strategies.	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.

Organizationa lContext	Organizational 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.