QUALIFICATION FILE

< CNC Programmer >

☒ Short Term Training (STT) ☐ Long Term Training (LTT) ☐ Apprenticeship

☐ Upskilling ☐ Dual/Flexi Qualification ☐ For ToT ☐ For ToA

☒General ☐ Multi-skill (MS) ☐ Cross Sectoral (CS) ☐ Future Skills ☐ OEM

NCrF/NSQF Level: 5

Submitted By:

< Capital Goods and Strategic Skill Council >
< 39, 1st Floor, Samyak Tower, Pusa Road, New Delhi-110005 >

Table of Contents

Section 1: Basic Details

1.	**Qualification Name**	**CNC Programmer**	
2.	**Sector/s**	**Capital Goods and Manufacturing**	
3.	**Type of Qualification: ☐ New ☒ Revised ☐ Has Electives/Options ☐OEM**	**NQR Code & version of existing/previous qualification:** *(change to previous, once approved)* *2022/CCM/CGSC/06613* V3.0	**Qualification Name of existing/previous version:** CNC Programmer
4.	**a. OEM Name** **b. Qualification Name** (*Wherever applicable)*		
5.	**National Qualification Register (NQR) Code &Version** (*Will be issued after NSQC approval)*	QG-05-CG-03928-2025-V2-CGSSC V4.0	**6. NCrF/NSQF Level: 5**
7.	**Award (Certificate/Diploma/Advance Diploma/ Any Other** *(Wherever applicable specify multiple entry/exits also & provide details in annexure)*	**Certificate**	
8.	**Brief Description of the Qualification**	The individual is responsible for interpreting technical blueprints, inputting the design specifications, adjusting the machine cutting paths, and performing quality checks on the final product to ensure the desired specifications are achieved.	
9.	**Eligibility Criteria for Entry for Student/Trainee/Learner/Employee**	**a. Entry Qualification & Relevant Experience:**	

S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)
1	Completed 2nd year of 3-year/ 4-years UG	No Experience required
2	Pursuing 2nd year of 3-year/ 4-years UG and continuing education	No Experience required
3	Completed 2nd year of diploma (after 12th)	No Experience required
4	Pursuing 2nd year of 2-year diploma after 12th	No Experience required
5	12th pass with 2 year of any combination of NTC/NAC/CITS or equivalent.	No Experience required

		6 | Completed 3-year diploma after 10th | 1 year relevant experience 7 | 12th Grade pass with 1-year of NTC/NAC | 1 year relevant experience 8 | Completed 1st year of 3-year/ 4-years UG | 1 year relevant experience 9 | 12th Grade pass | 2 year relevant experience 10 | 10th Grade pass | 4 year relevant experience 11 | Previous relevant Qualification of NSQF Level 4.5 | 1.5 year relevant experience 12 | Previous relevant Qualification of NSQF Level 4 | 3 year relevant experience **b. Age:** <18 Years>
10.	**Credits Assigned to this Qualification, Subject to Assessment** *(as per National Credit Framework (NCrF))*	18 **11. Common Cost Norm Category (I/II/III)** *(wherever applicable)*: **I**
12.	**Any Licensing requirements for Undertaking Training on This Qualification** *(wherever applicable)*	
13.	**Training Duration by Modes of Training Delivery** *(Specify **Total Duration** as per selected training delivery modes and as per requirement of the qualification)*	**☒Offline ☐Online ☐Blended** **Training Delivery Modes** | **Theory (Hours)** | **Practical (Hours)** | **OJT Mandatory (Hours)** | **Viva (Hours)** | **Total (Hours)** **Classroom (offline)** | 174 | 306 | 60 | - | 540 **Online** | | | | | | *(Refer Blended Learning Annexure for details)*
14.	**Aligned to NCO/ISCO Code/s** *(if no code is available mention the same)*	NCO-2015/ NIL
15.	**Progression path after attaining the qualification** *(Please show Professional and Academic progression)*	• Multi Axis CNC Machine Engineer – 6
16.	**Other Indian languages in which the Qualification & Model Curriculum are being submitted**	**Hindi**
17.	**Is similar Qualification(s) available on NQR-if yes, justification for this qualification**	**☐ Yes ☒ No URLs of similar Qualifications:**

18.	**Is the Job Role Amenable to Persons with Disability**	**☐ Yes ☒ No** **If "Yes", specify applicable type of Disability:**	
19.	**How Participation of Women will be Encouraged**	**Yes via Industry or College Engagement**	
20.	**Are Greening/ Environment Sustainability Aspects Covered** *(Specify the NOS/Module which covers it)*	**☐ Yes ☒ No To be incorporated later**	
21.	**Is Qualification Suitable to be Offered in Schools/Colleges**	**Schools ☐ Yes ☐ No Colleges ☒ Yes ☐ No**	
22.	**Name and Contact Details of Submitting / Awarding Body SPOC** *(In case of CS or MS, provide details of both Lead AB & Supporting ABs)*	**Name: Ridhima Sharma** **Email : technicaladvisors@cgssc.org** **Contact No.: +91-8882907092** **Website: www.cgssc.org**	
23.	**Final Approval Date by NSQC:**	**24. Validity Duration: 3 Years**	**25. Next Review Date**

Section 2: Module Summary

NOS/s of Qualifications

(In exceptional cases these could be described as components)

Mandatory NOS/s:

Specify the training duration and assessment criteria at NOS/ Module level. For further details refer curriculum document.

***Th.**-Theory **Pr.**-Practical **OJT**-On the Job **Man.**-Mandatory Training **Rec.**-Recommended **Proj.**-Project **Vi**-*Viva

S. No	NOS/Module Name	NOS/Module Code & Version *(if applicable)*	Core/ Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) *(if applicable)*
1.	Bridge Module & Follow the health and safety practices at work	CSC/N1335 NOS Version- 2.0	Non-Core	3	2	25	35	-	-	60	30	70	-	-	100	15
2.	Coordinate with co-workers to achieve work efficiency.	CSC/N1336 : Version No. – 2.0	Non-Core	3	1	10	20	-	-	30	30	70	-	-	100	10
3.	Program advanced digital manufacturing Computer Numerically Controlled	CSC/N0401 : Version No. – 3.0	Core	5	7	45	135	30		210	30	70	-	-	100	35

S. No	NOS/Module Name	NOS/Module Code & Version *(if applicable)*	Core/ Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) *(if applicable)*
	(CNC) machines.															
4.	Assist in process improvements and machine maintenance	CSC/N0415, v2.0	Core	5	6	70	80	30		180	30	70	-	-	100	35
5.	DGT/VSQ/N0102-Employability Skills (60 hours)	NOS Version No. – 1.0	ES	4	2	24	36	-	-	60	20	30	-	-	50	5
Duration (in Hours) / Total Marks					**18**	**174**	**306**	**60**		**540**	**140**	**310**	**-**	**-**	**450**	**100**

Elective NOS/s:

S. No	NOS/Module Name	NOS/Module Code & Version *(if applicable)*	Core/ Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) *(if applicable)*
1.																
2.																
Duration (in Hours) / Total Marks																

Optional NOS/s:

S. No	NOS/Module Name	NOS/Module Code & Version *(if applicable)*	Core/ Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) *(if applicable)*
1.																
2.																
Duration (in Hours) / Total Marks																

Assessment - Minimum Qualifying Percentage

*Please specify **any one** of the following:*

Minimum Pass Percentage – Aggregate at qualification level: 70 % *(Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)*

Minimum Pass Percentage – NOS/Module-wise: 70 % *(Every Trainee should score specified minimum passing percentage in each mandatory and selected elective NOS/Module to successfully clear the assessment.)*

Section 3: Training Related

1.	**Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*		**Trainer Prerequisites**						
			Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
					Years	***Specialization***	***Years***	***Specialization***	
			Diploma /Degree	Diploma /Degree in Mechanical Engineering	4	CNC Programmer	1		Practical skills and knowledge required in the relevant field
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*		**Master Trainer Prerequisites**						
			Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
					Years	***Specialization***	***Years***	***Specialization***	
			B.E/B.Tech	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	6	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	2	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	NA
			B.E/B.Tech	Mechanical/ Electrical/Electronics/ Automobile/ Instrumentation	7	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	1	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	NA
			M.E/M.Tech	Mechanical/ Electrical/Electronics/ Automobile/	4	Mechanical/ Electrical/ Electronics/	2	Mechanical/ Electrical/ Electronics/	NA

		Instrumentation | Automobile/ Instrumentation | Automobile/ Instrumentation
3.	**Tools and Equipment Required for Training**	☒Yes ☐No (*If "Yes", details to be provided in Annexure)*
4.	**In Case of Revised Qualification, Details of Any Upskilling Required for Trainer**	NA

Section 4: Assessment Related

	Assessor's Qualification and experience in relevant sector (in years) *(as per NCVET guidelines)*		**Assessor Prerequisites**						
			Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
					Years	***Specialization***	***Years***	***Specialization***	

			Diploma /Degree	Diploma /Degree in Mechanical Engineering	5	CNC Programmer	2		Practical skills and knowledge required in the relevant field

Proctor's Qualification and experience in relevant sector (in years) *(as per NCVET guidelines)*

Proctor's Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
B.E/B.Tech	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	6	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	2	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	NA
B.E/B.Tech	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	7	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	1	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	NA
M.E/M.Tech	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	3	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	2	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	NA

Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) *(as per NCVET guidelines)*

Proctor's Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
B.E/B.Tech	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	7	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	2	Mechanical/Electrical/ Electronics/ Automobile/ Instrumentation	NA
B.E/B.Tech	Mechanical/ Electrical/ Electronics/ Automobile/	8	Mechanical/Electrical/ Electronics/ Automobile/	1	Mechanical/Electrical/ Electronics/ Automobile/	NA

			Instrumentation		Instrumentation		Instrumentation	
		M.E/M.Tech	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	4	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	2	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	NA
	Assessment Mode *(Specify the assessment mode)*	**Formative, Summative & Skill Assessment**						
	Tools and Equipment Required for Assessment	☒ Same as for training ☐ Yes ☐ No *(details to be provided in Annexure-if it is different for Assessment)*						

Section 5: Evidence of the need for the Qualification

Provide Annexure/Supporting documents name.

1.	**Latest Skill Gap Study (not older than 2 years) (Yes/No):** No
2.	**Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):** No (Industry driven)
3.	**Government /Industry initiatives/ requirement (Yes/No):** Yes
4.	**Number of Industry validation provided:** NA
5.	**Estimated nos. of persons to be trained and employed:** 2500
6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments: Yes** If "No", why:

Section 6: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	**Annexure:** NCrF/NSQF level justification based on NCrF level/NSQF descriptors *(Mandatory)*	*Q File*
2.	**Annexure:** List of tools and equipment relevant for qualification *(Mandatory, except in case of online course)*	*Q File*
3.	**Annexure:** Detailed Assessment Criteria *(Mandatory)*	*Q File*
4.	**Annexure:** Assessment Strategy *(Mandatory)*	*Q File*
5.	**Annexure:** Blended Learning *(Mandatory, in case selected Mode of delivery is "Blended Learning")*	

6.	**Annexure:** Multiple Entry-Exit Details *(Mandatory, in case qualification has multiple Entry-Exit)*	
7.	**Annexure:** Acronym and Glossary *(Optional)*	
8.	**Supporting Document:** Model Curriculum *(Mandatory – Public view)*	
9.	**Supporting Document:** Career Progression *(Mandatory - Public view)*	
10.	**Supporting Document:** Occupational Map *(Mandatory)*	
11.	**Supporting Document:** Assessment SOP *(Mandatory)*	
12.	**Any other document you wish to submit:**	

Annexure: Evidence of Level

NCrF/NSQF Level Descriptors	Key requirements of the job role/ outcome of the qualification	How the job role/ outcomes relate to the NCrF/NSQF level descriptor	NCrF/NSQF Level
Professional Theoretical Knowledge/Process	**Wide-ranging specialized theoretical learning requirements** • Process of preparing for programming the CNC machine for production • Process of programming the CNC machine • Process of testing and proving the program on the CNC machine • Process of assisting in process improvements • Process of assisting in machine maintenance	The job involves a range of theoretical understanding and practical skills as can be seen from the job requirements given in the adjacent cell. The skills include programming CNC machines for carrying out machining on a variety of components and assisting in process improvements through coordination with relevant stakeholders and carrying out routine maintenance of machines	5
Professional and Technical Skills/ Expertise/ Professional	• Knowledge of applicable documentation requirements in the job role.	As indicated by the knowledge and understanding requirements	5

Knowledge	• Knowledge of using the correct and updated version of the program • Understand the importance of clamping the workpiece and tools firmly • Know how to read and interpret first and third angle component drawings • Know how to extract information from engineering drawings or data • Knowledge of entering the tool and work offsets correctly • Know how to adjust the feed and Revolutions Per Minute (RPM) • Understand the method of setting the workholding devices • Understand the importance of maintaining cleanliness and hygiene in the work area • Understand the importance and process of checking all designs	mentioned in the adjacent cell, the job holder needs to have a knowledge of programming CNC machines for carrying out machining on a variety of components and assisting in process improvements through coordination with relevant stakeholders and carrying out routine maintenance of machines.	
Employment Readiness & Entrepreneurship **Skills & Mind-set/Professional Skill**	• check the process sheet and match it with the received drawings • select and arrange the resources required for production • check the availability of the required tools and measuring instruments • conduct the preliminary checks to determine the readiness of the program • identify the tool requirements from the tooling layout • use subprograms and canned cycles to reduce program size • design new programs for all production machines to ensure quality • design program network to increase the efficiency of all programs • identify the maintenance needs of	As indicated by the performance criteria in the adjacent cell, the job holder needs to have wide-ranging knowledge of programming CNC machines for carrying out machining on a variety of components and assisting in process improvements through coordination with relevant stakeholders and carrying out routine maintenance of machines.	5

	machines such as worn-out or damaged parts through periodic inspections		
Broad Learning Outcomes/Core Skill	**Logical and mathematical skills** • Follow the technical specification and appropriate procedures. • Perform work-related calculations **Collecting and organising information** • Use the standard templates and tools for documenting work • Collect the relevant information concerning the programming CNC machines and carry out the appropriate documentation	The job holder requires logical and relevant mathematical skills for planning and managing the production process As indicated by the performance criteria in the adjacent cell, the job involves programming CNC machines for carrying out machining on a variety of components and assisting in process improvements through coordination with relevant stakeholders and carrying out routine maintenance of machines	5
Responsibility	• Responsible for conducting the preliminary checks to determine the readiness of the program • Responsible for selecting the suitable workholding device as per the job requirement • Responsible for creating the CNC program with commands for tool motions, spindle motions, miscellaneous functions and tool change. • Responsible for creating the CNC program, such as text editor or Computer-Aided Manufacturing (CAM) • Responsible for designing new programs for all production machines to ensure	A CNC Programmer is responsible for programming commercial Computer Numerical Control (CNC) factory machines that turn raw materials such as plastic and metals into usable components. The individual is responsible for interpreting technical blueprints; inputting the design specifications; adjusting the machine cutting paths; and performing quality checks on the final product to ensure the desired specifications are	5

	quality • Responsible for designing program networks to increase the efficiency of all programs. • Responsible for performing basic troubleshooting	achieved. The person is also responsible for carrying out routine machine maintenance and troubleshooting any issues encountered during the manufacturing process	

Annexure: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

Batch Size: 20-25 Nos

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	Chairs/Tables		25
2	Computer with internet		25
3	LCD projector with screen		1
4	Trainer chair and Table		1
5	Demonstration table pin up boards		1
6	White board with marker		1
7	CNC Machines	2-Axis CNC Machine, 3-Axis Machining Centers (VMC, HMC)	1 Each
8	Measuring Tools		1 Set
9	Hand Tools		1 Set
10	Power Tools		1 Set
11	GD & T Instruments		1 Set
12	Fire Extinguisher		1
13	Safety Gloves (Rubber)		25
14	Ear Plugs		25

15	Safety Shoes & Helmet		25
16	Goggles		25
17	First-Aid Kit		2

Classroom Aids
The aids required to conduct sessions in the classroom are:

1. Computer / Laptop
2. Whiteboard and marker
3. Projector

Annexure: Industry Validations Summary

Provide the summary information of all the industry validations in table. This is not required for OEM qualifications.

Annexure: Training & Employment Details

Training and Employment Projections:

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities

2025-2026	464	301	50	27	5	2
2026-2027	1250	812	140	73	12	7
2027-2028	1205	783	120	71	11	7

Data to be provided year-wise for next 3 years

Training, Assessment, Certification, and Placement Data for previous versions of qualifications:

Qualification Version	Year	Total Candidates				Women				People with Disability			
		Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed
	2022-2023	422	390	311	175	42.2	39	39	25	4	3	3	1
	2023-2024	1137	982	921	500	113	98	92	40	11	9	9	4
	2024-2025	1096	553	494	250	109	55	49	27	10	5	4	2

Applicable for revised qualifications only, data to be provided year-wise for past 3 years.

List Schemes in which the previous version of Qualification was implemented:

1. PMKVY 4.0 CSM STT
2. Non PMKVY
3. TNSDC
4. Fee Based
5. NABARD
6. MSSDS
7. GSDM
8. SDIS Orissa State Skilling Scheme
9. NULM
10. SDIS DDU GKY

Content availability for previous versions of qualifications: PH, FG

☐ Participant Handbook ☐ Facilitator Guide ☐ Digital Content ☐ Qualification Handbook ☐ Any Other:

Languages in which Content is available: Hindi

Annexure: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools:

Refer NCVET "Guidelines for Blended Learning for Vocational Education, Training & Skilling" available on:
https://ncvet.gov.in/sites/default/files/Guidelines%20for%20Blended%20Learning%20for%20Vocational%20Education,%20Training%20&%20Skilling.pdf

Annexure: Detailed Assessment Criteria

Detailed assessment criteria for each NOS/Module are as follows:

CSC/N1335: Follow the health and safety practices at the work

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Maintain personal health and safety	**7**	**12**	**-**	**-**
PC1. follow the recommended practices to ensure protection from infections and transmission to others, such as the use of hand sanitiser and face mask	2	3	-	-
PC2. check the work conditions, assess the potential health and safety risks, and take appropriate measures to mitigate them	1	2	-	-
PC3. select and use the appropriate Personal Protective Equipment (PPE) relevant to the task and work conditions	1	2	-	-
PC4. follow the recommended techniques while lifting and moving heavy objects to avoid injury	1	3	-	-

PC5. follow the manufacturer's instructions and workplace safety guidelines while working on heavy machinery, tools and equipment	2	2	-	-
Assist in hazard management	**4**	**10**	**-**	**-**
PC6. identify existing and potential hazards at work	1	1	-	-
PC7. assess the potential risks and injuries associated with the identified hazards	1	3	-	-
PC8. coordinate with the supervisor or other relevant personnel to prevent or minimise the identified hazards	1	3	-	-
PC9. handle hazardous materials safely and store them in the designated storage	1	3	-	-
Check the first aid box, firefighting and safety equipment	**3**	**7**	**-**	**-**
PC10. check the first aid box to ensure it is updated with the relevant first aid supplies	1	2	-	-
PC11. check and test the firefighting and various safety equipment to ensure they are in usable condition	1	3	-	-
Assessment Criteria for Outcomes	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
PC12. coordinate with the supervisor for the repair and replacement of firefighting and safety equipment	1	2	-	-
Assist in waste management	**3**	**8**	**-**	**-**
PC13. segregate waste into appropriate categories	1	3	-	-
PC14. recycle the recyclable waste appropriately	1	3	-	-
PC15. dispose of the non-recyclable waste in an environment-friendly manner, complying with the applicable regulations	1	2	-	-
Follow the fire safety guidelines	**3**	**12**	**-**	**-**

PC16. use the appropriate type of fire extinguisher to extinguish different types of fires safely	1	4	-	-
PC17. follow the recommended practices for a safe rescue during a fire emergency	1	4	-	-
PC18. coordinate with the fire department to request assistance to extinguish a serious fire	1	4	-	-
Follow the emergency and first-aid procedures	**7**	**12**	**-**	**-**
PC19. follow the organisational health and safety guidelines during workplace emergencies to ensure own and co-workers' safety	1	2	-	-
PC20. follow the recommended practices to minimise loss to organisational property during an emergency	1	3	-	-
PC21. follow the recommended procedure to free a person from electrocution	1	2	-	-
PC22. administer appropriate first aid to the injured personnel	1	2	-	-
PC23. perform Cardiopulmonary Resuscitation (CPR) on a potential victim of cardiac arrest	1	2	-	-
PC24. coordinate with the emergency services to request medical assistance for seriously injured/ ill personnel requiring professional medical attention or hospitalisation	2	1	-	-
Assessment Criteria for Outcomes	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
Carry out relevant documentation and review	**3**	**9**	**-**	**-**
PC25. carry out appropriate documentation following a health and safety incident at work, including all the required information	1	3	-	-
PC26. coordinate with the relevant personnel to review health and safety conditions at work regularly or following an incident	1	3	-	-

PC27. assist in implementing appropriate changes to improve the health and safety conditions at work	1	3	-	-
NOS Total	**30**	**70**	**-**	**-**

CSC/N1336: Coordinate with co-workers to achieve work efficiency

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Work effectively with co-workers	**20**	**43**	**-**	**-**
PC1. plan daily tasks at work to ensure their timely completion and efficient use of time	2	4	-	-
PC2. carry out work responsibilities adhering to the limits of authority	2	4	-	-
PC3. follow the supervisor's instructions to ensure adherence to the applicable quality standards and timescales	2	4	-	-
PC4. coordinate with the co-workers to achieve the work objectives efficiently	2	4	-	-
PC5. prepare the relevant documents and reports as per the supervisor's instructions, providing appropriate information clearly and systematically	2	4	-	-

PC6. coordinate with the supervisor or relevant personnel to deal with out of authority tasks and concerns	2	4	-	-
PC7. mentor and assist subordinates in the execution of their work responsibilities	2	4	-	-
PC8. identify possible disruptions to work through coordination with the relevant stakeholders and take appropriate preventive measures	2	4	-	-
PC9. use various resources efficiently to ensure maximum utilisation and minimum wastage	2	4	-	-
PC10. follow the recommended practices to avoid and resolve conflicts at work	1	4	-	-
PC11. follow the relevant organisational policies to ensure disciplined behaviour with maximum productivity at work	1	3	-	-
Communicate effectively with co-workers	**6**	**15**	**-**	**-**
PC12. follow the organisational policy for the efficient and timely dissemination of information to the authorised personnel	2	5	-	-
Assessment Criteria for Outcomes	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
PC13. communicate clearly and politely to ensure effective communication with co-workers	2	5	-	-
PC14. follow the appropriate techniques for active listening during interactions	2	5	-	-
Practice inclusion at work	**4**	**12**	**-**	**-**

PC15. empathise with Persons with Disabilities (PwD)	2	6	-	-
PC16. adopt gender-neutral behaviour at work	2	6	-	-
NOS Total	**30**	**70**	**-**	**-**

CSC/N0401: Program advanced digital manufacturing Computer Numerically Controlled (CNC) machines.

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare for programming the CNC machine for production	**7**	**13**	**-**	**-**
PC1. determine the job specifications and operational objectives by referring to job cards, work drawings, blueprints, work orders, charts, planning documentation, quality control documents, etc.	1	1	-	-

PC2. use reference charts, engineering drawings, tables and graphs to get relevant information such as tapping sizes and threads, cutting parameters, feeds, speed, depth of cut, machining tolerances, etc.	1	1	-	-
PC3. check the process sheet and match it with the received drawings and other specifications	-	1	-	-
PC4. check the availability of the required tools and measuring instruments	1	1	-	-
PC5. prepare the part program using the recommended G and M codes, in the appropriate sequence to maintain productivity and component quality	-	1	-	-
PC6. prepare the work area as per the operations requirements	-	1	-	-
PC7. follow the job instructions, assembly drawings and laid down procedures	1	1	-	-
PC8. conduct the preliminary checks to determine the readiness of the program so that the CNC machine operates correctly	1	1	-	-
PC9. coordinate with the relevant personnel to report and rectify incorrect and inconsistent information in job specification documents	1	1	-	-
PC10. determine the method for programming the machine for CNC programming	-	1	-	-
PC11. identify the tool requirements from the tooling layout and assess their suitability	1	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. select the suitable workholding device as per the job requirement	-	1	-	-
PC13. ensure the correct and latest part-program is uploaded onto the CNC system	-	1	-	-
Program the CNC machine	**9**	**20**	**-**	**-**
PC14. create the CNC program with commands for tool motions, spindle motions, miscellaneous functions and tool change, in syntax corresponding to the machine and control system on which the component will be machined	1	2	-	-
PC15. follow the appropriate method for creating the CNC program, such as text editor or Computer- Aided Manufacturing (CAM) software or controllers on machine	1	2	-	-
PC16. ensure the part program is efficient and results in minimal cycle time, with optimal cutting parameters and no unnecessary tool motions	1	2	-	-
PC17. use subprograms and canned cycles to reduce program size and input time, and prevent memory overflow on the machine	1	2	-	-
PC18. transfer the program to the machine by entering it in the console or transmitting it through a wired link or a data transfer device	-	1	-	-
PC19. use the part program in single block mode and check the condition of the tool after each operation	1	1	-	-

PC20. check the coolant has the recommended level and coolant nozzles are positioned appropriately	-	1	-	-
PC21. check the sequence of the program as per the process sheet	-	1	-	-
PC22. check spindle and chuck runout and repeatability of all linear axis	1	1	-	-
PC23. follow the recommended procedures for calling up the program and dealing with any error messages or faults	-	1	-	-
Assessment Criteria for Outcomes	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
PC24. identify abnormal noises coming from the machine and component, and adjust the feed and Revolutions Per Minute (RPM), as required	-	1	-	-
PC25. check the condition of the tools being used, and repair them, as required	1	1	-	-
PC26. use the relevant Industry 4.0 manufacturing technologies to ensure interconnectivity, automation, machine learning, and real-time data collection and analysis	1	1	-	-
PC27. follow the approved procedures to resolve problems encountered with the programming, loading and editing activities	-	1	-	-
PC28. use the appropriate storage medium such as a computer hard disk for saving the proven program	-	1	-	-

PC29. carry out relevant documentation as per the organizational policy	1	1	-	-
Test and prove the program on the CNC machine	**12**	**33**	**-**	**-**
PC30. select and prepare the appropriate tools and equipment for testing and proving the program, ensuring they are not worn-out or damaged	1	2	-	-
PC31. ensure all the measuring equipment are calibrated and approved for use	1	1	-	-
PC32. pre-set the tooling appropriately using setting jigs/fixtures	1	1	-	-
PC33. mount tools in the correct positions in the tool turret or magazine	-	1	-	-
PC34. check the tools are mounted in positions corresponding to the tool numbers in the part program	1	1	-	-
PC35. measure tool and work offset data i.e. X and Z offsets for lathes; and work offsets, length offsets and tool radius for machining centres, maintaining the recommended margin for errors	1	1	-	-
Assessment Criteria for Outcomes	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
PC36. ensure the component is free of burrs, chips or other materials on its butting surfaces	1	1	-	-
PC37. mount the part on machine firmly in the specified work holding devices, with the appropriate clamping force	1	1	-	-

PC38. enter work offset and tool data on the machine X and Z offsets, tool orientation and nose radius for lathes; length offsets and tool radius for machining centres	1	1	-	-
PC39. ensure that tool data is entered in offset numbers corresponding to the tool offset numbers in the part program	-	1	-	-
PC40. follow the recommended practices to resolve error messages and faults on the program or equipment	-	1	-	-
PC41. cut a trial part using single block run, dry run and feed, and speed override controls	-	1	-	-
PC42. edit the program and adjust tool and wear offsets to correct any dimensional errors on the part	-	1	-	-
PC43. identify inconsistencies in dimensions due to tool wear, and correct the offsets accordingly	1	1	-	-
PC44. adjust the machine settings whenever required to maintain the required accuracy	-	1	-	-
PC45. identify the need of sharpening or replacing the tools	-	1	-	-
PC46. sharpen or replace the worn-out/ damaged tools, and modify tool offsets according to the new tools, using the necessary equipment and following the relevant safety guidelines and organisational standards	-	1	-	-
PC47. check the component according to the post- machining sheet to ensure its quality	1	1	-	-

PC48. ensure the trial part conforms to drawing specifications in terms of dimensions, surface finishes and geometrical parameters such as concentricity, parallelism, runout, etc.	-	1	-	-
Assessment Criteria for Outcomes	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
PC49. carry out handover of the machine to the machine operator for machining the batch of parts, along with relevant instructions and documentation on periodic inspection of components, change of worn-out tools	-	1	-	-
PC50. correct the tool wear offsets based on the results of the periodic inspection, as appropriate	-	1	-	-
PC51. replace the worn-out tools and indexable inserts, whenever required	-	1	-	-
PC52. cut a trial part and correct any dimensional inaccuracies by adjusting the tool offsets or wear offsets after every change of a worn-out tool	1	1	-	-
PC53. ensure there is no damage to the tools/fixtures while performing prove out	-	1	-	-
PC54. follow the shutdown procedure to return the equipment to a safe condition on the conclusion of activities	-	1	-	-
PC55. follow the recommended practices to resolve any problems within the limits of authority and control, and report those that cannot be solved to the relevant personnel	-	1	-	-

PC56. prepare and verify all technical documents for CNC programs	-	2	-	-
PC57. ensure the availability of all the required tooling information	-	2	-	-
PC58. perform the appropriate quality assurance tests to ensure the final product meets the design specifications	1	2	-	-
Use resources optimally	**2**	**4**	**-**	**-**
PC59. optimize the usage of electricity and other resources in various tasks and processes	1	2	-	-
PC60. connect the electrical tools and equipment safely, and turn them off when not in use	1	2	-	-
NOS Total	**30**	**70**	**-**	**-**

CSC/N0415: Assist in process improvements and machine maintenance

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Assist in process improvements	**18**	**40**	**-**	**-**

PC1. coordinate with the engineering and supervisory personnel to troubleshoot and resolve design, equipment and operating difficulties	3	5	-	-
PC2. ensure optimal use of the bill of materials for various applications and oversee all process validation functions	3	5	-	-
PC3. check all designs and find appropriate solutions to reduce manufacturing cost and time	2	5	-	-
PC4. monitor the CNC programs and ensure accuracy of all instructions through comparison with original blueprints	2	5	-	-
PC5. design new programs for all production machines to ensure quality	2	5	-	-
PC6. design program network to increase the efficiency of all programs	2	5	-	-
PC7. develop new processes to reduce the time for CNC programs and resolve any issues encountered with them	2	5	-	-
PC8. assist in training all operators in the use of new CNC programs and equipment	2	5	-	-
Assist in machine maintenance	**12**	**30**	**-**	**-**
PC9. check each machine periodically to ensure the positioning of drills, mills, and lathes are aligned appropriately	2	5	-	-
PC10. identify the maintenance needs of machines such as worn-out or damaged parts through periodic inspections	2	5	-	-

PC11. maintain the machines in optimal working condition through regular and preventative maintenance as per the relevant maintenance checklists	2	5	-	-
Assessment Criteria for Outcomes	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
PC12. ensure worn-out and damaged parts are replaced with manufacturer-recommended authentic parts	2	5	-	-
PC13. perform basic troubleshooting when a machine malfunctions	2	5	-	-
PC14. follow the manufacturer's instructions for carrying out various maintenance activities such as cleaning and sharpening	2	5	-	-
NOS Total	**30**	**70**	**-**	**-**

DGT/VSQ/N0101- Employability Skills (60 Hrs)

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Introduction to Employability Skills	**1**	**1**	**-**	**-**
PC1. identify employability skills required for jobs in various industries	-	-	-	-

PC2. identify and explore learning and employability portals	-	-	-	-
Constitutional values – Citizenship	**1**	**1**	**-**	**-**
PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC4. follow environmentally sustainable practices	-	-	-	-
Becoming a Professional in the 21st Century	**2**	**4**	**-**	**-**
PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC6. practice the 21st Century Skills such as Self- Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
Basic English Skills	**2**	**3**	**-**	**-**
PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-

PC9. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
Career Development & Goal Setting	**1**	**2**	**-**	**-**
PC10. understand the difference between job and career	-	-	-	-
PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
Communication Skills	**2**	**2**	**-**	**-**
PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
PC13. work collaboratively with others in a team	-	-	-	-
Diversity & Inclusion	**1**	**2**	**-**	**-**
PC14. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
Financial and Legal Literacy	**2**	**3**	**-**	**-**
PC16. select financial institutions, products and services as per requirement	-	-	-	-
PC17. carry out offline and online financial transactions, safely and securely	-	-	-	-

PC18. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
Essential Digital Skills	**3**	**4**	**-**	**-**
PC20. operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-	-

Entrepreneurship	**2**	**3**	**-**	**-**
PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
Customer Service	**1**	**2**	**-**	**-**
PC26. identify different types of customers	-	-	-	-

PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
PC28. follow appropriate hygiene and grooming standards	-	-	-	-
Getting ready for apprenticeship & Jobs	**2**	**3**	**-**	**-**
PC29. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC31. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total	**20**	**30**	**-**	**-**

Assessment Parameters:

Assessment Plan:

1. Components of Assessment:

- Each subject will be assessed in three components: Theory (40% weightage), Practical (40% weightage), and On-job Training (OJT, 20% weightage).

2. Passing Parameters:

- To pass the semester, students must meet both the assessment parameters given below.

Parameter 1 - Weighted Semester Score:

- Students must achieve a minimum of 60% in the weighted average score across all three components (Theory, Practical, and OJT) for each subject.

Parameter 2 - Individual Component Score:

- Students need to score at least 40% in each individual component (Theory, Practical, and OJT) of every subject.

Annexure: Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required competencies of the program.

Mention the detailed assessment strategy in the provided template.

<1. Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SIP or email
- Assessment agencies send the assessment confirmation to VTP/TC looping SSC
- Assessment agency deploys the ToA certified Assessor for executing the assessment
- SSC monitors the assessment process & records

2. Testing Environment:
   - Check the Assessment location, date and time
   - If the batch size is more than 30, then there should be 2 Assessors.
   - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
3. Assessment Quality Assurance levels/Framework:
   - Question bank is created by the Subject Matter Experts (SME) are verified by the other SME
   - Questions are mapped to the specified assessment criteria
   - Assessor must be ToA certified & trainer must be ToT Certified
4. Types of evidence or evidence-gathering protocol:
   - Time-stamped & geotagged reporting of the assessor from assessment location
   - Centre photographs with signboards and scheme specific branding
5. Method of verification or validation:
   - Surprise visit to the assessment location
6. Method for assessment documentation, archiving, and access
   - Hard copies of the documents are stored

On the Job:

1. Each module (which covers the job profile of CNC Programmer) will be assessed separately.
2. The candidate must score 60% in each module to successfully complete the OJT.
3. Tools of Assessment that will be used for assessing whether the candidate is having desired skills and etiquette of dealing with customers, understanding needs & requirements, assessing the customer and perform Soft Skills effectively:
   • Videos of Trainees during OJT
   •
4. Assessment of each Module will ensure that the candidate is able to:

- Effective engagement with the customers
- Understand the working of various tools and equipment
- …..>

Annexure: Acronym and Glossary

Acronym

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework
NOS	National Occupational Standard(s)

NQR	National Qualification Register
NSQF	National Skills Qualifications Framework
OJT	On the Job Training

Glossary

Term	Description
National Occupational Standards (NOS)	NOS define the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do.
Qualification	A formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards
Qualification File	A Qualification File is a template designed to capture necessary information of a Qualification from the perspective of NSQF compliance. The Qualification File will be normally submitted by the awarding body for the qualification.
Sector	A grouping of professional activities on the basis of their main economic function, product, service or technology.
Long Term Training	Long-term skilling means any vocational training program undertaken for a year and above. https://ncvet.gov.in/sites/default/files/NCVET.pdf