



QUALIFICATION FILE

Machine Operator & Programmer – CNC Milling

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

☐ Up skilling ☐ Dual/Flexi Qualification ☐ For ToT ☐ For ToA

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

NCrF/NSQF Level: 4

Submitted By:

Central Institute of Petrochemicals Engineering & Technology (CIPET)
Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilizers, Govt. of India
CIPET Head office, T.V.K Industrial Estate, Guindy, Chennai – 600 032.

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Section 1: Basic Details

1.	Qualification Name	Machine Operator & Programmer – CNC Milling (MOP-CNC-M)																			
2.	Sector/s	Chemicals & Petrochemicals (CPC)																			
3.	Type of Qualification: ☐ New ☒ Revised ☐ Has Electives/Options ☐ OEM	NQR Code & version of existing/previous qualification: <i>(change to previous, once approved)</i> - 2021/CP/CIPET/04631	Qualification Name of existing/previous version: Machine Operator & Programmer – CNC Milling																		
4.	a. OEM Name b. Qualification Name <i>(Wherever applicable)</i>	Not Applicable.																			
5.	National Qualification Register (NQR) Code&Version <i>(Will be issued after NSQC approval)</i>	QG-04-CP-04127-2025-V2-CIPET	6. NCrF/NSQF Level: 4																		
7.	Award (Certificate/Diploma/Advance Diploma/ Any Other) <i>(Wherever applicable specify multiple entry/exits also & provide details in annexure)</i>	Certificate																			
8.	Brief Description of the Qualification	Machine Operator & Programmer – CNC Milling Qualification is designed to familiarize individuals with the CNC milling process and provide opportunities to work in the tooling industry.																			
9.	Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	a. Entry Qualification & Relevant Experience: <table border="1"> <thead> <tr> <th>S. No.</th> <th>Academic/Skill Qualification (with Specialization - if applicable)</th> <th>Required Experience (with Specialization - if applicable)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>12th or equivalent</td> <td>-</td> </tr> <tr> <td>2.</td> <td>10th or equivalent</td> <td>2 years of (NTC/ NAC)</td> </tr> <tr> <td>3.</td> <td>11th or equivalent</td> <td>1.5 years relevant experience</td> </tr> <tr> <td>4.</td> <td>10th or equivalent</td> <td>3 years relevant experience</td> </tr> <tr> <td>5.</td> <td>Previous relevant Qualification of NSQF Level 3.5</td> <td>1.5 years relevant experience</td> </tr> </tbody> </table>		S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1.	12 th or equivalent	-	2.	10 th or equivalent	2 years of (NTC/ NAC)	3.	11 th or equivalent	1.5 years relevant experience	4.	10 th or equivalent	3 years relevant experience	5.	Previous relevant Qualification of NSQF Level 3.5	1.5 years relevant experience
S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)																			
1.	12 th or equivalent	-																			
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4.	10 th or equivalent	3 years relevant experience																			
5.	Previous relevant Qualification of NSQF Level 3.5	1.5 years relevant experience																			
10.	Credits Assigned to this Qualification, Subject to Assessment <i>(as per National Credit Framework (NCrF))</i>	22	11. Common Cost Norm Category (I/II/III) <i>(wherever applicable): I</i>																		
12.	Any Licensing requirements for Undertaking Training on This Qualification <i>(wherever applicable)</i>	-																			

13.	Training Duration by Modes of Training Delivery (<i>Specify Total Duration as per selected training delivery modes and as per requirement of the qualification</i>)	☒ Offline ☐ Online ☐ Blended <table border="1" data-bbox="936 180 2038 399"> <thead> <tr> <th>Training Delivery Modes</th> <th>Theory (Hours)</th> <th>Practical (Hours)</th> <th>OJT Mandatory (Hours)</th> <th>OJT Recommended (Hours)</th> <th>Total (Hours)</th> </tr> </thead> <tbody> <tr> <td>Classroom (offline)</td> <td>210</td> <td>390</td> <td>60</td> <td>-</td> <td>660</td> </tr> <tr> <td>Online</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table> (Refer Blended Learning Annexure for details)				Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)	Classroom (offline)	210	390	60	-	660	Online	-	-	-	-	-
Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)																		
Classroom (offline)	210	390	60	-	660																		
Online	-	-	-	-	-																		
14.	Aligned to NCO/ISCO Code/s (<i>if no code is available mention the same</i>)	NCO-2015/7223.5001																					
15.	Progression path after attaining the qualification (<i>Please show Professional and Academic progression</i>)	Shift In-charge/Supervisor in Tool Room, Tool & Die Making, Mould Manufacturing, Capital Goods Manufacturing Industry																					
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	During selection of candidates for the training programme, Female candidates are given preference																					
20.	Are Greening/ Environment Sustainability Aspects Covered (<i>Specify the NOS/Module which covers it</i>)	☐ Yes ☒ No																					
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 (<i>In case of CS or MS, provide details of both Lead AB & Supporting ABs</i>)	Name: Arunav Banerjee Email: cipethovtc@cipet.gov.in Contact No.: 9402183512 Website: www.cipet.gov.in																					
23.	Final Approval Date by NSQC: 26.05.2025	24. Validity Duration: 3 Years		25. Next Review Date: 25.05.2028																			

Section 2: Module Summary

NOS/s of Qualifications

(In exceptional cases these could be described as components)

Mandatory NOS/s: 08

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

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

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.	Perform machining operations on metal or plastic material using Conventional Milling machine	CPC/N7111 & V2.0	Core	4	3	30	60	-	-	90	50	80	-	-	130	-
2.	Perform machining operations on metal or plastic workpieces using Computer Numerically Controlled Milling machines	CPC/N7112 & V2.0	Core	4	6	40	140	-	-	180	50	100	-	-	150	-
3.	Programming of Computer Numerically Controlled (CNC) Milling Machines	CPC/N7121 & V2.0	Core	4	6	50	130	-	-	180	50	150	-	-	200	-
4.	Maintain basic health and safety practices at the Workplace,5S	CPC/N0411 & V2.0	Core	4	1	10	20	-	-	30	10	30	-	-	40	-
5.	Effective working with others	CPC/N7014 & V2.0	Core	4	1	10	20	-	-	30	10	10	-	-	20	-
6.	Basics of computer and data entry in MS Office/Office open source software	CPC/N0219 & V2.0	Core	4	1	10	20	-	-	30	10	10	-	-	20	-
7.	Employability Skills	DGT/VSQ/N0102 & V1.0	Non-Core	4	2	60	-	-	-	60	20	20	-	-	40	-
8.	On the Job Training (OJT)	N/A	Core	4	2	-	-	60	-	60	-	-	-	-	-	-
Duration (in Hours) / Total Marks			-	-	22	210	390	60	-	660	200	400	-	-	600	-

Elective NOS/s:

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NS QF 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/NS QF 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 PercentagePlease specify **any one** of the following:**Minimum Pass Percentage – Aggregate at qualification level:**

50% for theory and 70% for practical (Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)

Minimum Pass Percentage – NOS/Module-wise:

(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) <i>(as per NCVET guidelines)</i>	Diploma with minimum 2 years experience in field of Mechanical / Production / Plastics Mould / Tool / Tool & Die / Manufacturing Engineering / Technology
2.	Master Trainer's Qualification and experience in the relevant sector (in years) <i>(as per NCVET guidelines)</i>	B.E. / B.Tech. / M.Sc. with 2 years experience in the field of Mechanical / Production / Plastics Mould / Tool / Tool & Die / Manufacturing Engineering / Technology
3.	Tools and Equipment Required for Training	☒ Yes ☐ No <i>(If "Yes", details to be provided in Annexure)</i>
4.	In Case of Revised Qualification, Details of Any Upskilling Required for Trainer	Nil

Section 4: Assessment Related

1.	Assessor's Qualification and experience in relevant sector (in years) <i>(as per NCVET guidelines)</i>	Diploma with minimum 5 years experience (or) B.E. / B.Tech. with minimum 2 years experience in the field of Mechanical / Production / Plastics Mould / Tool / Tool & Die / Manufacturing Engineering / Technology
2.	Proctor's Qualification and experience in relevant sector (in years) <i>(as per NCVET guidelines)</i>	Diploma with minimum 6 years experience (or) B.E. / B.Tech. with minimum 3 years experience in the field of Mechanical / Production / Plastics Mould / Tool / Tool & Die / Manufacturing Engineering / Technology
3.	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) <i>(as per NCVET guidelines)</i>	B.E. / B.Tech. with minimum 4 years experience (or) M.E. / M.Tech. with minimum 2 years experience in the field of Mechanical / Production / Plastics Mould / Tool / Tool & Die / Manufacturing Engineering / Technology
4.	Assessment Mode <i>(Specify the assessment mode)</i>	Physical Assessment
5.	Tools and Equipment Required for Assessment	☒ Same as for training ☐ Yes ☐ No <i>(details to be provided in Annexure-if it is different for Assessment)</i>

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
3.	Government /Industry initiatives/ requirement (Yes/No): YES
4.	Number of Industry validation provided: 05 Nos.
5.	Estimated nos. of persons to be trained and employed: 1500 Candidates
6.	Evidence of Concurrence/Consultation with Line Ministry/State Departments: YES If "No", why:

Section 6: Annexure & Supporting Documents Checklist

Specify Annexure Name / Supporting document file name

1.	Annexure: NCrf/NSQF level justification based on NCrf level/NSQF descriptors (Mandatory)	- Entry Qualification for this course is 12th or equivalent - or 10th or equivalent with 2 years of (NTC/ NAC) - Or 11th or equivalent with 1.5 years relevant experience - Or 10th or equivalent with 3 years relevant experience - Or - Previous relevant Qualification of NSQF Level 3.5 with 1.5 years relevant experience - After successful completion of training, Trainee / Candidates are eligible for Shift Incharge/ Supervisor in the Tooling Industry. - Job description: The Machine Operator & Programmer – CNC Milling sets up, programs, and operates CNC milling machines to produce precise components. Responsibilities include programming, quality control, troubleshooting and safety adherence.
2.	Annexure: List of tools and equipment relevant for qualification (Mandatory, except in case of online course)	Equipment Required: Classroom equipment: LCD Projector/Screen, Computer, charts, Black / White board & Duster. Measuring equipment: Steel Ruler, Micrometer, Vernier Caliper, Radius gauge, Feeler gage, Steel measuring tape, Weighing Balance (1 No.) Hand Tools: Hammer, screwdriver set with Multiple heads, Allen key hexagonal, File triangular, Hacksaw, adjustable, Spanner set double side, Adjustable spanner Personal Protective equipment: Safety Goggles, Rubber Gloves, Asbestos gloves, Fire Extinguisher, Apron, Helmet, First Aid Box with Medicines. Raw material: Mild Steel, Stainless Steel, Aluminium, Brass. Equipment & Auxiliaries equipment: Conventional Milling machine, CNC Milling Machine, CAM software, CNC Simulator, Machine vice, Cutting Tools-end Mills, Face Mills, etc Both HSS & Carbide Inserts types. CNC controller Different Type CNC Controllers.
3.	Annexure: Detailed Assessment Criteria (Mandatory)	- Criteria for assessment for each Qualification Document are being created by CIPET. - Each Assessable outcome (AO) will be assigned marks proportional to its importance in Learning Outcome and few performance criteria may be allotted marks in combination. - Each Learning outcome will be assessed both for theoretical knowledge and practical knowledge which is being proportionately demonstrated in the table below.

		4. The assessment for the theory part will be based on a knowledge bank of questions created by CIPET which will contain multiple choice theory questions and a Practical question database with mark allotment criteria. 5. To pass the Qualification Document, every trainee should score a minimum of 50 % in Functional and all Generic Learning Outcomes. 6. In case of successfully passing only a certain number of Learning Outcomes, the trainee is eligible to take Subsequent assessment on the balance Learning Outcomes to pass the Qualification Document.
4.	Annexure: Assessment Strategy(Mandatory)	Assessment strategy: • Assessment criteria for Qualification Document have been developed. Each Learning outcome has separate marks for Theory and Practical Skills. • The Training Assessment Wing will have assessors who will not be associated with training activities and will be provided training on the said work. Thus it will ensure that the assessment carried out is fair and consistent. • Set of question banks developed to assess theoretical and practical knowledge. To ensure the quality, each trainee gets a unique set of questions. • Trainees have to score minimum marks separately for theoretical and practical skill and overall percentage should also be 50% for theory and 70% for practical. • Empanelment of subject matter expert as assessor to assess trainees specifically on practical skills. • Assessments are preferably conducted by written examination papers in English/ regional languages according to the requirement. • It has to be ensured that TP/trainer should not be present during assessment.
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)	Enclosed as Annexure-I
9.	Supporting Document: Career Progression (Mandatory - Public view)	Enclosed as Annexure-II
10.	Supporting Document: Occupational Map (Mandatory)	Enclosed as Annexure-III
11.	Supporting Document: Assessment SOP (Mandatory)	Enclosed as Annexure-IV
12.	Any other document you wish to submit: Industry validation	Enclosed as Annexure-V

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
Process	Machine Operator & Programmer – CNC Milling is expected to Operate Computerized Numerical Controlled (CNC) Lathe Machine and he has to carried out the following: - Understanding the working principle & construction of Milling machine - Carrying out operations on conventional Milling machine - Prepare the program for machining using manual data input or by using appropriate software. - The program is transferred to the machine's controller by entering it at the console, transmitting it through a wired link, or copying it through a data storage device. - Perform safe operations with a minimum of supervision, taking personal responsibility for one's own actions and for the quality and accuracy of the work produced. - Measuring and checking the work piece as per specification - Understanding the working principle of CNC Milling machine - Carry out various machining operations using CNC machine - To understand the importance, knowledge and practices an operator needs to observe at the workplace. It includes understanding of the potential dangers at the workplace, the practices to minimize risks and how to deal in case of accidents and emergency situations.	Machine Operator & Programmer – CNC Milling requires advanced skills to program and operate milling machines for various tasks. It involves a comprehensive understanding of both conventional and CNC milling principles. The operator must follow precise procedures, make informed decisions, ensure work accuracy, and perform tasks with minimal supervision. The role emphasizes responsibility for quality, risk management, and adherence to safety practices.	4
Professional knowledge	The user/individual on the job needs to know and understand: - Working principle, construction, knowledge and practices of the conventional & CNC Milling machine - Concept of engineering drawing, isometric and orthographic projection, sectional views, auxiliary views, dimensioning. - Safety mechanisms on the machine, safety guards and procedure to check their functionality CNC programming procedures, Different kinds of Programs for various kinds of operations in CNC Milling Machine.	The operator must understand CNC and conventional milling principles, interpret engineering drawings, and adhere to safety standards. Proficiency in CNC programming for various operations is essential, reflecting the level's emphasis on theoretical understanding, risk management, and complex task execution.	4
Professional skill	The user/individual on the job needs to know and understand: General principles, procedure and process knowledge, loading and unloading procedure for the Conventional and CNC Milling Machines.	The operator must have comprehensive knowledge of milling machine principles, tools, and processes. He/she must have the ability to program, plan,	4

	• Different types of tools and machinery The individual on the job needs to know and understand how to: • Prepare the program for machining using manual data input or by using appropriate software. • Plan, prioritize and sequence work operations as per job requirements • Shall be able to detect out of tolerance limit of component or any malfunctioning of the machine and take corrective action • Decide when to contact supervisor in case of any unresolved problems • Analyse and interpret geometric dimensions and tolerances and apply balanced judgments to different situations. • Think through the problem, evaluate the possible solutions and take or suggest optimum solution • Seek appropriate assistance from other sources to resolve problems • Identify sources of support that can be availed of for problem solving for various kind of problems • Identify immediate or temporary solutions to resolve delays ➤ Identify and understand the possible causes and their effect on the health and safety at the workplace.	prioritize, and sequence tasks, detect malfunctions, and take corrective actions.	
Core skill	The individual on the job needs to know and understand how to: Read and interpret correctly the job specifications from drawing/ job card, manuals, safety instructions etc. in English and/ or local language Able to fill up the required formats/ documents in English and / or local language Interact and communicate with supervisor or other company personnel as per requirement Shall be able to use simple numerical computation such as addition, subtraction, multiplication, division, fractions and decimal, percentages and proportions, simple ratios and average Check and clarify task-related information, other issues from the supervisor, coordinates, subordinates etc.	The operator must have the ability to read and interpret job specifications, manuals, and safety instructions. The operator must be able to communicate effectively with supervisors and colleagues, perform basic mathematical computations, and clarify task-related information.	4
Responsibility	The operator is responsible for his own job and self learning. He/she prepare the program for machining and set up basic machine controls and operates the CNC Milling in order to produce the desired machined components as per the approved drawing and perform safe operations with a minimum of supervision, taking personal responsibility for one's own actions and for the quality and accuracy of the work produced.	The operator must prepare programs, set up machine controls, and operate the CNC Milling machine to produce components according to specifications. The operator should emphasize safety with minimal supervision and take accountability for the quality and accuracy of the work	4

Annexure: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

Batch Size: Maximum 50 candidates per batch

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1.	Measuring equipment	Steel Ruler, Micrometer, Vernier Caliper, Radius gauge, Feeler gauge, Steel measuring tape, Weighing Balance (1 No.)	As per requirement
2.	Hand Tools	Hammer, screwdriver set with Multiple heads, Allen key hexagonal, File triangular, Hacksaw, adjustable, Spanner set double side, Adjustable spanner	As per requirement
3.	Personal Protective equipment	Safety Goggles, Rubber Gloves, Asbestos gloves, Fire Extinguisher, Apron, Helmet, First Aid Box with Medicines	As per requirement
4.	Raw material	Mild Steel, Stainless Steel, Aluminum, Brass	As per requirement
5.	Equipment & Auxiliaries Equipment	Conventional Milling machine, CNC Milling Machine, CAM software, CNC Simulator, Machine vice, Cutting Tools-end Mills, Face Mills, etc. Both HSS & Carbide Inserts types. CNC controller Different Type CNC Controllers.	As per requirement

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. LCD Projector/Screen,
2. Computer
3. Charts
4. White board & Marker pen

Annexure: Industry Validations Summary

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

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile (if available)
1	Glanze Engineering Co. Pvt. Ltd.,	Mr. Ajay Kolhe	Production Incharge	G-36, MIDC Chalkalthana, Aurangabad – 431 210	8554049994	Ajayglanze.com	-
2	Hindustan Pipes & Fittings Pvt. Ltd.	Mr. Jitendra Kumar Singhal	Director	E216 & E216A, RIICO Industrial Area, sarna Dungar, Phase-1, Jhotwara Extension, Jaipur – 302 012	9649425333	Hindustanpipe2009@gmail.com	-
3	Kadambari Industries	Mr. Durgesh Sharma	Manager - QA	Plot No.B-3, Shri Tirupati Udhog Vihar, Near RIICO Industrial Area, Kaladera, Jaipur – 303 801	8278649893	Kdindustries2018@gmail.com	-
4	Microturners	Mr. Ashwani Kumar	Plant Head	Unit-2, Village Jharmajri, Tehsil Baddi, Solan – 173 205, Himachal Pradesh	9218666023	ashwani.kumar@microturnersmail.com	-
5	P J Industries	Mr. J. Ram Prakash	Managing Director	No. 18/27, 4 th Pillayar Koil Street, Ekkattuthangal, Chennai – 600032, Tamil Nadu	7418025518	pjindustries@gmail.com	-

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
2024-25	1500	1200	75	60	-	-
2025-26	1500	1200	75	60	-	-
2026-27	1500	1200	75	60	-	-

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
1.0	2021-22	155	155	155	127	13	13	13	11	-	-	-	-
1.0	2022-23	491	491	491	413	35	35	35	28	-	-	-	-
1.0	2023-24	377	377	377	315	22	22	22	18	-	-	-	-

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. CSR Scheme
2. PM-DAKSH Scheme
3. NSSH Scheme

Content availability for previous versions of qualifications:

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

Languages in which Content is available: English & 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>

S. No.	Select the Components of the Qualification	List Recommended Tools – for all Selected Components	Offline : Online Ratio
1	Theory/ Lectures - Imparting theoretical and conceptual knowledge		
2	Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners		
3	Showing Practical Demonstrations to the learners		
4	Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training		
5	Tutorials/ Assignments/ Drill/ Practice		
6	Proctored Monitoring/ Assessment/ Evaluation/ Examinations		
7	On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training		

Annexure: Detailed Assessment Criteria

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

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
CPC/ N 7111 Perform machining operations on metal or plastic material using Conventional Centre Milling machine	AO1. Understand and comply with safety, environmental & other relevant regulations and guidelines.	1	2	-	-
	AO2. Wear personal protective equipment (PPE) like safety glasses, apron, no loose clothes/ hair, safety shoes while performing Milling operations regulations while performing CNC turning operations.	1	2	-	-
	AO3. Ensure work area is clean and safe	1	2	-	-
	AO4. Ensure that machine safety guards are in place and are in correctly working condition.	1	2	-	-
	AO5. Ensure that all tools, equipment are in safe and usable conditions.	1	2	-	-
	AO6. Ensure availability of job specification i.e. approved drawings, sketches, instructions from the supervisor, job instruction sheet/ job card.	1	2	-	-
	AO7. Read and understand the Job requirements from the job specifications and attention shall be given to the geometric tolerances.	1	2	-	-
	AO8. Check the workpiece material for the dimensions and ensure that it is free from foreign objects, dirt or other contamination and is within the required size.	1	2	-	-
	AO9. Plan to perform the turning or other Milling operations and the sequence of operations as per required job specifications.	1	2	-	-
	AO10. Obtain all the appropriate tools and measuring instruments/ gauges required for the job.	1	2	-	-
	AO11. Check the Milling machine for its functioning and ensure that it is ready for operation.	2	3	-	-
	AO12. Prepare the Milling machine for the operations by mounting and setting the required work holding devices and cutting tools.	2	3	-	-
	AO13. Clarify any doubt, if any and see necessary instruction /training on the operation of the machine whenever required.	2	3	-	-
	AO14. Hold the workpiece securely and correctly, without distortion.	2	3	-	-
	AO15. Adjust the machine settings as per job requirement to maintain desired accuracy.	2	3	-	-
	AO16. Adjust and set the speed and feed of the Milling machine to achieve the job specifications.	2	3	-	-
	AO17. Operate the machine tool controls safely and correctly, in line with operational procedures both in manual and power modes.	2	3	-	-
	AO18. Stop the Milling machine, both in normal and emergency situations correctly by following the right procedure and should be able to restart the machine after and emergency	2	3	-	-
	AO19. Should be able to use the Milling machine accessories and attachments such as steady and follower rests, tail stock, taper turning attachments, profile attachments etc.	2	3	-	-
	AO20. Perform various Milling operations using different tools to produce components with various	2	3	-	-

	features.				
	AO21. Produce components as per required quality standards and free from burrs & sharp edges	2	3	-	-
	AO22. Shall achieve given production targets.	2	3	-	-
	AO23. Shall be able to apply roughing and finishing cuts, considering the effect on tool life, surface finish and dimensional accuracy.	2	3	-	-
	AO24. Shall be able to use coolants/ cutting fluids for different combinations of workpiece and tool as per different locations.	2	3	-	-
	AO25. Shall be able to observe and report any difficulties/ discrepancies that may arise during the machine operation and carry out the corrective actions as per instructions.	2	3	-	-
	AO26. Correctly shutting down the machine on completion of the machining operations, removing and disposing of the chips/ waste and critical parameters at different locations.	2	3	-	-
	AO27. Use of measuring instruments/ gauges to check the critical parameters.	2	3	-	-
	AO28. Shall be able to carry out the corrective action, in the case of deviation from the required specifications.	2	3	-	-
	AO29. Report the problem to the supervisor, if it cannot be resolved.	2	3	-	-
	AO30. Seek guidance from the supervisor/ specialist of the problem is outside his/her area of competence.	2	3	-	-
	Sub total	50	80	-	-
CPC/ N 7112 Perform machining operationson metal or plastic work pieces using Computer Numerically Controlled Milling machines	AO1. Understand and comply with safety, environmental & other relevant regulations and guidelines.	1	2	-	-
	AO2. Wear personal protective equipment (PPE) like safety glasses, apron, no loose clothes/ hair, safety shoes while performing Milling operations while performing CNC turning operations.	1	2	-	-
	AO3. Ensure the work area is clean and safe.	1	2	-	-
	AO4. Ensure that machine safety guards are in place and are in correctly working condition.	1	2	-	-
	AO5. Ensure that all tools, equipment are in safe and usable conditions.	1	2	-	-
	AO6. Ensure availability of job specification i.e. approved drawings, sketches, instructions from the supervisor, job instruction sheet/ job card.	1	2	-	-
	AO7. Read and understand the Job requirements from the job specifications and attention shall be given to the geometric tolerances.	1	2	-	-
	AO8. Check the workpiece material for the dimensions and ensure that it is free from foreign objects, dirt or other contamination and is within the required size.	1	2	-	-
	AO9. Plan to perform the turning or other Milling operations and the sequence of operations as per required job specifications on CNC Milling machine.	1	2	-	-
	AO10. Obtain all the appropriate tools and measuring instruments/ gauges required for the job.	1	2	-	-
	AO11. Check the CNC Milling machine for its functioning and ensure that it is ready for operation	1	2	-	-
	AO12. Prepare the CNC Milling machine for the operations by mounting and setting the required work	1	2	-	-

	holding devices and cutting tools				
	AO13. Clarify any doubt, if any and see necessary instruction /training on the operation of the CNC Milling machine whenever required	1	2	-	-
	AO14. Hold the workpiece securely and correctly, without distortion	1	2	-	-
	AO15. Adjust the CNC Milling machine settings as per job requirement to maintain desired accuracy	1	2	-	-
	AO16. Perform daily maintenance of the machine according to a defined checklist, at the beginning of day's shifts.	1	2	-	-
	AO17. Use and extract information from engineering drawings, dimensioning and tolerances	1	2	-	-
	AO18. Use and extract information from reference charts, tables, graphs and Engineering standards	1	2	-	-
	AO19. Load and unload component(s) using predetermined fixtures or work holding devices as per work instructions	1	2	-	-
	AO20. Make basic program and check correctness of program through dry run and single block check	1	2	-	-
	AO21. Adjust and set the speed and feed of the CNC Milling machine to achieve the job specifications	1	3	-	-
	AO22. Operate the machine tool controls safely and correctly, in line with operational procedures.	1	3	-	-
	AO23. Stop the CNC Milling machine, both in normal and emergency situations correctly by following the right procedure and should be able to restart the machine after the emergency.	1	3	-	-
	AO24. Do the first part cutting trial by setting tool offsets to get the oversize part.	1	3	-	-
	AO25. Measure the critical parameters of the machined component on the machine (without removing from the machine).	1	3	-	-
	AO26. Correct the offsets based on the measurements by accessing the program edit facility in order to enter tooling data.	1	3	-	-
	AO27. Measure the component after unloading to check for accuracy in the critical parameters as per job specifications.	1	3	-	-
	AO28. Produce machined components that combine different turning operations and have a range of features.	1	3	-	-
	AO29. Follow the specified machining sequence and procedure as per job specifications.	1	3	-	-
	AO30. Interpret in-built machine alarms & respond to the same as per operating manual or specified instructions.	1	3	-	-
	AO31. Observe for inconsistency in dimensions due to tool wear and correct the offsets accordingly.	2	3	-	-
	AO32. Ensure that machine settings are adjusted as and when required, either by self or the setter, to maintain the required accuracy.	2	3	-	-
	AO33. Identify when tools need replacement and replace worn tools with new tools.	2	3	-	-
	AO34. Produce components as per required standards.	2	3	-	-
	AO35. Report problems and seek appropriate assistance in a timely manner	2	3	-	-
	AO36. Complete documentation during and post operations as per organizational procedures and	2	3	-	-

	applicable quality management system.				
	AO37. Return the machine and all tools and equipment to the correct location on completion of activities.	2	3	-	-
	AO38. Leave the work area in a safe and tidy condition on completion of job activities as per 5S practices.	2	3	-	-
	AO39. Report the problem to the supervisor, if it cannot be resolved.	2	3	-	-
	AO40. Seek guidance from the supervisor/ specialist of the problem is outside his/her area of competence.	2	3	-	-
	Sub total	50	100	-	-
CPC/ N 7121 Programming of Computer Numerically Controlled (CNC) Milling Machines	AO1. Comply with health and safety, environmental and other relevant regulations and guidelines at work.	1	3	-	-
	AO2. Adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while programming CNC Milling machines.	1	3	-	-
	AO3. Work following laid down procedures and instructions.	1	3	-	-
	AO4. Ensure that machine guards are in place and are correctly adjusted.	1	3	-	-
	AO5. Read and understand safety instructions, warning signs on the machine	1	3	-	-
	AO6. Ensure the work area is clean and safe from hazards.	1	3	-	-
	AO7. Ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition.	1	3	-	-
	AO8. Ensure availability of job specification i.e. approved drawings, sketches, instructions from the supervisor, job instruction sheet/ job card.	1	3	-	-
	AO9. Read and establish job requirements from the job specification document accurately.	1	3	-	-
	AO10. Follow job instructions, assembly drawings and laid down procedures at all times.	1	3	-	-
	AO11. Report and rectify incorrect and inconsistent information in job specification documents as per organization procedures.	1	3	-	-
	AO12. Use and extract information from reference charts, tables, graphs and standards.	1	3	-	-
	AO13. Prepare the work area as per procedure or operational specification.	1	3	-	-
	AO14. Conduct a preliminary check of the readiness of the program so that the CNC machine operates correctly.	1	3	-	-
	AO15. Determine what operational objectives and targets need to be achieved and how best the machine needs to be programmed to achieve this.	1	3	-	-
	AO16. Extract and use information from engineering drawings and related specifications in relation to work undertaken.	1	3	-	-
	AO17. Identify tool requirements from tooling layout and assess their suitability.	1	3	-	-
	AO18. Identify suitable workholding or fixturing devices as per the job requirement.	1	3	-	-

AO19. Ensure the correct and latest part-program is uploaded onto the CNC system.	1	3	-	-
AO20. Make CNC program with commands for tool motions, spindle motions, miscellaneous functions & tool change, in syntax corresponding to machine and control system on which the component will be machined.	1	3	-	-
AO21. Various ways to make CNC programs are by writing it on paper or in a computer's text editor, or using CAM software or controllers on machine Ways: written, directly entered into the machine controller, using computer software- CAM software.	1	3	-	-
AO22. Ensure that the part program is efficient & results in minimal cycle time, with optimal cutting parameters and no unnecessary tool motions.	1	3	-	-
AO23. Use subprograms and canned cycles, to reduce program size and input time and avoid memory overflow on the machine.	1	3	-	-
AO24. Transfer the program to the machine by entering it at the console or transmitting it through a wired link or through a data transfer device.	1	3	-	-
AO25. Follow the correct procedures for calling up the program and dealing with any error messages or faults.	1	3	-	-
AO26. Handle the typical problems that can occur with the programming, loading and editing activities effectively using approved procedures.	1	3	-	-
AO27. Save the proven program in the appropriate storage medium – paper, computer hard disk, etc. and location.	1	3	-	-
AO28. Complete relevant documentation as per organizational procedure.	1	3	-	-
AO29. Leave the work area in a safe and tidy condition on completion of the activities.	1	3	-	-
AO30. Obtain appropriate equipment or tools needed as per job requirements.	1	3	-	-
AO31. ensure that all measuring equipment is calibrated and approved for usage.	1	3	-	-
AO32. Ensure that the tools and fixtures are in usable condition(eg. free from breakage, damage, calibration, etc.).	1	3	-	-
AO33. Pre-set tooling appropriately using setting jigs/ fixtures.	1	3	-	-
AO34. Seek any necessary instruction/training on operation of the machine where required.	1	3	-	-
AO35. Mount tools in the correct positions in the tool turret or magazine.	1	3	-	-
AO36. Check that the tools have been mounted in positions corresponding to tool numbers in the part program.	1	3	-	-
AO37. Mount the part on the machine firmly in the specified work holding devices, with the appropriate clamping forces.	1	3	-	-
AO38. Enter work offset and tool data on the machine – X and Z offsets, tool orientation and LOe radius for Millings; length offsets and tool radius for machining centers.	1	3	-	-
AO39. Ensure that tool data has been entered in offset numbers corresponding to tool offset numbers	1	3	-	-

	in part program.				
	AO40. Deal with error messages and faults on the program or equipment.	1	3	-	-
	AO41. Cut a trial part using single block run, dry run and feed and speed override controls.	1	3	-	-
	AO42. Edit the program and adjust tools and wear offsets to correct any dimensional errors on the part.	1	3	-	-
	AO43. Ensure that the trial part conforms to drawing specifications in terms of dimensions, surface finishes & geometrical parameters like concentricity, parallelism, run out, etc.	1	3	-	-
	AO44. Correct the tool wear offsets whenever required, based on the results of the period inspection.	1	3	-	-
	AO45. Change worn out tools and indexable inserts whenever required.	1	3	-	-
	AO46. After every change of a worn out tool or insert, cut a trial part and correct any dimensional inaccuracies by adjusting the tool offsets or wear offsets.	1	3	-	-
	AO47. Return worn out cutting tools, work holding devices / fixtures / instruments / drawings to store.	1	3	-	-
	AO48. Ensure that there is no damage to the tool/fixture while doing the prove-out.	1	3	-	-
	AO49. Shut down the equipment to a safe condition on conclusion of the activities.	1	3	-	-
	AO50. Deal promptly and effectively with problems within the span of responsibility and control and report those that cannot be solved.	1	3	-	-
	Sub total	50	150	-	-
CPC/ N 0411 Maintain basic health and safety practices at the workplace, 5S	AO1. Wear protective clothing/equipment for specific tasks and work conditions	0.5	2	-	-
	AO2. Carry out safe working practices while dealing with hazards to ensure the safety of self and others.	0.5	2	-	-
	AO3. Apply good housekeeping practices at all times	0.5	2	-	-
	AO4. Use the various appropriate fire extinguishers on different types of fires correctly	0.5	2	-	-
	AO5. Demonstrate rescue techniques applied during fire hazard, demonstrate good housekeeping in order to prevent fire hazards, demonstrate the correct use of a fire extinguisher.	0.5	2	-	-
	AO6. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise, and Identify areas in the plant which are potentially hazardous/unhygienic in nature. Conduct regular checks with support of the maintenance team on machine health to identify potential hazards due to wear and tear of machine.	0.5	2	-	-
	AO7. Inform the concerned authorities on the potential risks identified in the processes, workplace area/ layout, materials used etc, Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations.	0.25	1	-	-
	AO8. Create awareness amongst others by sharing information on the identified risks.	0.25	1	-	-
	AO9. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and un- necessary items are not cluttering the workbenches or work surfaces.	0.5	2	-	-
	AO10. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work	0.5	2	-	-

	instructions				
	AO11. Follow the technique of waste disposal and waste storage in the proper bins as per SOP	0.5	1	-	-
	AO12. Segregate the items which are labeled as red tag items for the process area and keep them in the correct places	0.5	1	-	-
	AO13. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions	0.5	1	-	-
	AO14. Ensure that areas of material storage areas are not overflowing	0.5	1	-	-
	AO15. Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required	0.5	1	-	-
	AO16. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area	0.5	1	-	-
	AO17. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards.	0.5	1	-	-
	AO18. Follow the proper labelling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists	0.5	1	-	-
	AO19. Check that the items in the respective areas have been identified as broken or damaged	0.5	1	-	-
	AO20. Follow the given instructions and check for leveling of fluids, oils, lubricants, solvents, chemicals etc. and proper storage of the same To avoid spillage, leakage, fire etc	0.5	1	-	-
	AO21. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions.	0.5	2	-	-
	Sub total	10	30	-	-
CPC/ N 7014 Effective working with others	AO1. Display appropriate communication etiquette while working.	1	1	-	-
	AO2. Display active listening skills while interacting with others at work.	1	1	-	-
	AO3. Demonstrate responsible and disciplined behaviors at the workplace.	1	1	-	-
	AO4. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required.	1	1	-	-
	AO5. Accurately pass on information to authorized persons who require it and within agreed timescale & confirm its receipt.	2	2	-	-
	AO6. Display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible.	2	2	-	-
	AO7. Consult with & assist others to maximize effectiveness and efficiency in carrying out tasks.	1	1	-	-
	AO8. Escalate grievances and problems to appropriate authority as per procedure to resolve them & avoid conflict.	1	1	-	-
	Sub total	10	10	-	-

CPC/ N 0219 Basics of computer and data entry in MS OFFICE/office Open sourcesuite Software	AO1. Fill and process mandated forms for receiving, processing, or tracking data enter data from source documents (such as trial report, process sheet etc.) into Computer applications having MS OFFICE software.	1	1	-	-
	AO2. Scan source documents in accordance with specific instructions.	1	1	-	-
	AO3. verify data entered with source documents, checks for compliance and corrects all typographical errors and missing or repeated data.	1	1	-	-
	AO4. Maintain files of source documents or other information related to data entered.	1	1	-	-
	AO5. Investigate and confirm data that is unclear before entering, generate reports of data entry, store completed work in designated locations and perform backup operations.	2	2	-	-
	AO6. update database information to reflect most current source information	2	2	-	-
	AO7. assist in the filing and storage of security and back up data files	1	1	-	-
	AO8. respond to requests for information and access relevant files	1	1	-	-
	Sub total	10	10	-	-
DGT/VSQ/N0102 Employability Skills	AO1. Essential skills for success 1. Building basic skills to navigate life and career. 2. Self-Awareness, articulating personal values, Value-based decision making, Dilemma situations. 3. Identify sources and types of stress (positive / negative stress), Managing stress (long-term / short-term), Handling rejection and building resilience, Identify day wasters.	5	5	-	-
	AO2. Labour welfare legislation Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act, POSH. Interpret applicable labour and industrial laws.	5	5	-	-
	AO3. Preparation to the world of work 1. Career Plan 2. Career Pathways 3. Search and apply for a job	5	5	-	-
	AO4. Customer interaction / service 1. Greeting customers 2. Probing-understanding customer requirements 3. Handling grievances 4. Relationship building with customers	5	5	-	-
	Sub total	20	20	-	-
	Total	200	400		-

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 are assigned to Training Assessment Wing (TAW), CIPET HO for planning of assessment
- Training Centers request TAW for Assessment and Certification of Trainees
- TAW identifies suitable assessor and nominates the assessor to the respective Training Centre
- TAW monitors the assessment process
- Training Centers maintains necessary records

2. Testing Environment:

- Check the Assessment location, date and time
- If the batch size is more than 30, then there should be 02 Assessors in a day (or) 01 assessor in 2 days
- Check that the allotted time to the candidates to complete the Theory & Practical Assessment

3. Assessment Quality Assurance levels/Framework:

- Question bank / Question Paper is prepared by the Subject Matter Experts (SME) / Assessor
- Questions are mapped to the specified assessment criteria
- Certified Assessor & Trainer will be engaged in the process

4. Types of evidence or evidence-gathering protocol:

- Date / Time recorded for the reporting of the assessor from assessment location
- Assessment batch - Group Photo of Trainees along with Assessor

5. Method of verification or validation:

- Surprise visit to the assessment location
- Virtual meet with the Assessor / Trainees

6. Method for assessment documentation, archiving, and access

- Hard copies of the documents are stored, soft copies of assessment evidences are stored in Email for future correspondence

On the Job:

1. Each module (which covers the job profile of Machine operator & Programmer CNC Milling will be assessed during the assessment.
2. The candidate must have adequate knowledge in the relevant module of the OJT.
3. Evidences of OJT:
 - Videos of Trainees during the OJT
 - Photographs of Trainees during the OJT
4. 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 defines 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