



QUALIFICATION FILE

Operator (CNC Milling Machine)

☒ 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: 4

Submitted By:

Karnataka Skill Development Corporation

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Table of Contents

Section 1: Basic Details 3

Section 2: Module Summary 5

 NOS/s of Qualifications..... 5

 Mandatory NOS/s: 5

 Elective NOS/s: 7

 Optional NOS/s: 7

 Assessment - Minimum Qualifying Percentage..... 7

Section 3: Training Related 8

Section 4: Assessment Related 8

Section 5: Evidence of the need for the Qualification..... 8

Section 6: Annexure & Supporting Documents Check List 9

 Annexure 1: Evidence of Level..... 10

 Annexure 2: Tools and Equipment (Lab Set-Up) 13

 Annexure 3: Industry Validations Summary 15

 Annexure 4: Training & Employment Details 15

 Annexure 5: Blended Learning 16

 Annexure 6: Detailed Assessment Criteria 17

 Annexure 7: Assessment Strategy 19

 Annexure 8: Acronym and Glossary 20

Section 1: Basic Details

1.	Qualification Name	Operator (CNC Milling Machine)	
2.	Sector/s	Capital Goods and Manufacturing	
3.	Type of Qualification: ☐ New ☐ Revised ☐ Has Electives/Options ☐ OEM	NQR Code & version of existing/previous qualification: <i>(change to previous, once approved)</i> 2022/CCM/KSDC/05929	Qualification Name of existing/previous version: Operator (CNC Milling Machine)-V1
4.	a. OEM Name b. Qualification Name <i>(Wherever applicable)</i>	Operator (CNC Milling Machine)	
5.	National Qualification Register (NQR) Code &Version <i>(Will be issued after NSQC approval)</i>	QG-04-CG-05929-2025-V2-KSDC	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	This course is designed to develop skills in the operations & programing of CNC Milling Machines. It provides hands on experience on machining of various components by considering required parameters such as feed, depth of cut, cutting speed, cutter selection, cutter radius compensation, Tool wear compensations, parametric programming, sister tool concept etc. In this course students will get opportunities to work on case studies and project work related various industries. After successfully completing the course and obtaining requisite certification, the students will have career opportunities to work as 'CNC Milling Machine Technician / Programmer in manufacturing roles across machine tool manufacturing companies automotive, defense, aerospace, locomotive, construction, consumer goods, etc. Industries.	
9.	Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	a. Entry Qualification & Relevant Experience: 12th grade pass OR Completed 2nd year of 3-year diploma (after 10th) OR Pursuing 2nd year of 3-year regular Diploma (after 10th) OR 10th grade pass with two years of any combination of NTC/NAC/CITS or equivalent OR 8th pass plus 2-year NTC plus 1-Year NAC plus 1-Year CITS OR 11th Grade Pass with 1.5-year relevant experience OR	

		10th Grade Pass with 3-year relevant experience OR Previous relevant Qualification of NSQF Level 3.5 with 1.5-year relevant experience OR Previous relevant Qualification of NSQF Level 3.0 with 3-year relevant experience b. Age: Minimum Age: 15 Years																						
10.	Credits Assigned to this Qualification, Subject to Assessment <i>(as per National Credit Framework (NCrF))</i>	14	11. Common Cost Norm Category (I/II/III) <i>(wherever applicable):</i>																					
12.	Any Licensing requirements for Undertaking Training on This Qualification <i>(wherever applicable)</i>	NA																						
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"> <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>105</td><td>165</td><td>150</td><td></td><td>420</td></tr> <tr> <td>Online</td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <i>(Refer Blended Learning Annexure for details)</i>					Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)	Classroom (offline)	105	165	150		420	Online					
Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)																			
Classroom (offline)	105	165	150		420																			
Online																								
14.	Aligned to NCO/ISCO Code/s <i>(if no code is available mention the same)</i>	7223.5001 - Machining Technician/CNC Operator																						
15.	Progression path after attaining the qualification <i>(Please show Professional and Academic progression)</i>	- Operator (CNC Milling Machine) → Sr. Operator (CNC Milling Machine) → Supervisor (CNC Milling Machine) - Entrepreneurship																						
16.	Other Indian languages in which the Qualification & Model Curriculum are being submitted	No																						
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																							
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: Nagaraja NM, IAS Managing Director, Karnataka Skill Development Corporation Email: md.ksdc@karnataka.gov.in Contact No.: 080 2952 2222																						

		Website: https://kaushalkar.karnataka.gov.in/en	
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

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.	Comply with workshop health and safety guidelines		Non – Core	4	1	5	0			5	2	4		3	9	9
2.	Understand and apply the principles of basic engineering design, mathematics, measurement systems, tools and techniques, machining processes, and industrial materials.		Core	4		20	5			25	2	4		3	9	9
3.	Understand manufacturing drawings, GD&T, manufacturing processes, and recognize the importance of quality in manufacturing.		Core	4	1	5	10			15	2	4		3	9	9
4.	Understand the operation of a CNC milling machine, including		Core	4		5	10			15	2	4		3	9	9

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)
	worktable coordinates, tool changer functions, preparation of cutting fluid concentration, and identification of electrical and pneumatic connections.															
5.	Understand and apply the principles of Basics of Engineering Design, Mathematics, system of measurements, Measurements and Tools, Machining, various types of material used in industries.		Core	4	1	10	20			30	2	4		3	9	9
6.	Operate CNC milling using standard procedures and use quality tools to inspect the component.		Core	4	1	10	20			30	2	4		4	10	10
7.	Select, edit, and create different programs using G/M codes also use simulator to optimize the tool paths and reduce machining time.		Core	4	2	20	40			60	2	4		4	10	10
8.	Assignments (Based on case studies and Industrial application)		Core	4	2	20	40			60	2	5		6	13	13
9.	OJT / Mini Project (Based on Industrial application)		Core	4	5			150		150	2	5		7	14	14
10.	Employability Skills		Non-Core	4	1	10	20			30	2	2		4	8	8
Duration (in Hours) / Total Marks				4	14	105	165	150		420	20	40		40	100	100

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 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: ____ % (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>	Graduate in Engineering with 2-year experience in relevant field and domain certification.
2.	Master Trainer's Qualification and experience in the relevant sector (in years) <i>(as per NCVET guidelines)</i>	Graduate in Engineering with 4-year experience in relevant field and domain certification.
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	

Section 4: Assessment Related

1.	Assessor's Qualification and experience in relevant sector (in years) <i>(as per NCVET guidelines)</i>	Graduate in Engineering with 4-year experience in relevant field.
2.	Proctor's Qualification and experience in relevant sector (in years) <i>(as per NCVET guidelines)</i>	Graduate in Engineering with 2-year experience in relevant field.
3.	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) <i>(as per NCVET guidelines)</i>	Graduate in Engineering with 6-year experience in industry or training experience.
4.	Assessment Mode <i>(Specify the assessment mode)</i>	Offline
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): Yes
2.	Latest Market Research Reports or any other source (not older than 2 years) (Yes/No): Yes
3.	Government /Industry initiatives/ requirement (Yes/No): Yes
4.	Number of Industry validation provided:
5.	Estimated nos. of persons to be trained and employed:
6.	Evidence of Concurrence/Consultation with Line Ministry/State Departments: NA 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 <i>(Mandatory)</i>	<i>Annexure 1</i>
2.	Annexure: List of tools and equipment relevant for qualification <i>(Mandatory, except in case of online course)</i>	<i>Annexure 2</i>
3.	Annexure: Detailed Assessment Criteria <i>(Mandatory)</i>	<i>Annexure 6</i>
4.	Annexure: Assessment Strategy <i>(Mandatory)</i>	<i>Annexure 7</i>
5.	Annexure: Blended Learning <i>(Mandatory, in case selected Mode of delivery is "Blended Learning")</i>	<i>NA</i>
6.	Annexure: Multiple Entry-Exit Details <i>(Mandatory, in case qualification has multiple Entry-Exit)</i>	<i>NA</i>
7.	Annexure: Acronym and Glossary <i>(Optional)</i>	<i>Annexure 8</i>
8.	Supporting Document: Model Curriculum <i>(Mandatory – Public view)</i>	<i>Model Curriculum</i>
9.	Supporting Document: Career Progression <i>(Mandatory - Public view)</i>	
10.	Supporting Document: Occupational Map <i>(Mandatory)</i>	
11.	Supporting Document: Assessment SOP <i>(Mandatory)</i>	
12.	Any other document you wish to submit:	

Annexure 1: 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	- The machine operator is expected to assist in understanding the customer's needs, operate vertical milling centre machine, application of tools, jigs and fixtures, program and simulation, and perform minor repairs. - Maintain the work area, tools and instruments and ensure good working condition of required tools.	- During the duration of this course, the students are imparted knowledge on CNC Machining, Engineering Drawing, Workshop Practices, and employability skills related to the job role and trained on Skills related to CNC Machining. - The students shall undertake live projects and are expected to engage in extracurricular activities so that their morale and confidence is built up. - Practical skills are imparted on the Advanced CNC Machines and the theory related to this subject is taught in a way that the students are able to use their cognitive skills and use it while executing the task assigned to them. - The milling machine operator operates the machine, knows how to clamp and set the part using jigs, fixtures and other tools, applies his knowledge of customer needs to program and simulate and carry out minor repairs. He / She also maintains tools and instruments in good working condition.	NSQF Level 4
Professional and Technical Skills/ Expertise/ Professional Knowledge	Considering the basic Professional knowledge, which is a product design and developer to assist in new creation & upgradation in existing product.	- Operation Monitoring - Watching gauges, dials, or other indicators to make sure a machine is working properly. - Production and Processing - Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods. - Mechanical - Knowledge of machines and tools, including their designs, uses, repair, and maintenance 3 axis machining implies that the work piece remains in the same position while the cutting tool operates along the XYZ plane to trim away material. This is suitable for parts that don't require a lot of depth and detailing. 3 axis machining is most commonly used to produce mechanical components and is best suited	NSQF Level 4

		for: • Automatic/interactive operation • Milling slots • Drilling holes • Cutting sharp edges	
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	• Working as a member of a team/ within a team. Display Personal Motivation. Positive Attitude & Passion for Work • Good skills in written and oral communication with some clarity, basic knowledge of Language to support such communication. • Intermediate literacy and Numeracy skills • Skills for workshop calculations and basic of arithmetic and algebraic principles. • Good logical and analytical reasoning skills.	• Machine operator to assist in new Part program creation & modification in existing machine part program as per customer requirements & engineering standards. • Operates the VMC, working on VMC simulation software & basic repair and maintenance as per manual. Thus, able to develop the component for new creation or upgrade the existing component. • The CNC manufacturing process is largely automated. However, as per need the operator may be required to change the existing part program or make a new program. The part program has to be simulated operated in dry run and then run in single block mode to produce the component. The part made will be checked by measuring instruments for part quality as per specification.	NSQF Level 4
Broad Learning Outcomes/Core Skill	• Machine operator is expected to identify the customer needs, create the machining program, simulation of created program, create machined component as per industry standard, Optimize the machining process by further analyzing simulation, operate VMC machine, & ensure the product quality with the help of measuring instruments. If any support needed follow superior's instructions • Expected to be good in communication skills. Jobholder is expected to conduct themselves in ways, which show a basic understanding of the social and professional environment of working at workshops and on field visits	• The machine operator should be able to communicate with the part designer/programmer/process designer via the media of engineering drawings. • He / she must be able to communicate clearly with his supervisor if he foresees errors in the quality of the finished part. He must also appreciate the requirement to finish machining within the stipulated hours and the repercussions from top management in case of delays. He must work with his supervisor as part of a team.	NSQF Level 4
Responsibility	The jobholder is responsible to: • Assist to identify the customer needs. • Assist to create the program and simulations using software.	• CNC operators are responsible for entering tooling instructions into CNC machines from tooling datasheets, loading the raw material to be machined and setting up the tools (e.g. setting zero	NSQF Level 4

	• Assist to create cutting tool parameters for milling job operations • Assist to optimize tool path using software. • Assist in selection of cutting tools and its holders • Assist to operate milling machine operations as per Standard operating procedure & safety guidelines. • Assist in calculation of machine and operator efficiency with help of cycle time • Maintain tools and work area as per safety guidelines of machine maintenance. • The limited Responsibility for own work and majorly functions in close supervision in his routine activity he is responsible for his own work	and reference points). • When the set-up has been completed, the operator starts the machining process, monitoring progress and intervening where necessary to make adjustments or corrections (e.g. to change tools or to reposition the work piece) • Set-up and manage CNC machines to perform different jobs including drilling and milling. • Translate engineering drawings and requirements into dimensions for production. • Ensure the CNC machine operates in accordance with the company guidelines. • Oversee the machines while they execute the tasks and make the necessary changes to produce improved results. • Check machinery on a daily basis to guarantee functionality. • Record all machine actions by completing production and quality logs. • Provide timelines for clients. • Communicate logistics issues that arise in the process of creating a part. • Ensure that results of the machining process align with client expectations. • Conduct regular CNC machine assessments	
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Annexure 2: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

Batch Size:

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	Computer Aided Manufacturing Software	--	10 Nos
2	Vertical Machining Center	--	1 No
3	6K-40T vector drive spindle	--	1 No
4	TC-10-EDU 10-Station Automatic Tool Changer	--	1 No
5	CPK-MM Coolant Pump Kit	--	1 No
6	Servo Rotary Table	--	1 No
7	4AXD 4th-Axis Drive and Wiring	--	1 No
8	SIMULATOR	--	1 No
9	Voltage Stabilizer	--	1 No
10	Reciprocating Air compressor	--	1 No
11	Electrical cable	Standard	1 No
12	Copper Earthing Rod	Standard	1 No
13	Hand Tool Set	Standard	1 No
14	Clamping kit T16M14	-	1 No
15	Tooling Set BT40	Standard	1 No
16	Manual Vise for VF-2-I		1 No
17	UPS		1 No
18	Industrial Workstations with configurations capable of running latest version of CAM software		20 Nos
19	Steel rule	30 cm & 60 cm graduated both in English & Metric units	20 Nos
20	Micrometer Outside	0 – 50 mm outside	10 Nos
21	Vernier Caliper	0- 15 cm	10 Nos
22	Micrometer Inside	up to 20 mm	10 Nos
23	Hand Gloves	—	10 Nos
24	Safety Shoes	—	10 Nos
25	Helmet	—	10 Nos
26	“ V ” block	V-Block pair 7 cm with clamps	10 Nos
27	“ V ” block	V-Block 15 cm with clamps	10 Nos
28	Metal L	Metal - L - 15cm	10 Nos
29	Metal L	Metal - L - 30cm	10 Nos
32	Angle Plate	10 x 20 cm.	10 Nos
33	Spirit Level	15 cm metal	10 Nos

34	File warding	15 cm smooth	10 Nos
35	File knife edge	15 cm smooth	10 Nos
36	File cut saw	15 cm smooth	10 Nos
37	File feather edge	15 cm smooth	10 Nos
38	File triangular	15 cm smooth	10 Nos
39	File round	20 cm second cut	10 Nos
40	File square	15 cm second cut	10 Nos
41	File square	25 cm second cut	10 Nos
42	File triangular	20 cm second cut.	10 Nos
43	File flat	30 cm second cut.	10 Nos
44	File flat	20 cm bastard	10 Nos
45	File flat	30 cm bastard.	10 Nos
46	File Swiss type	Needle set of 12.	10 Nos
47	File half round	25 cm second cut.	10 Nos
48	File half round	25 cm bastard.	10 Nos
49	File round	30 cm bastard.	10 Nos
50	File hand	15 cm second cut.	10 Nos
51	Card file.	----	10 Nos
60	Clamp "C"	5 cm	10 Nos
61	Clamp "C"	10 cm	10 Nos
62	Scraper flat	15 cm.	10 Nos
63	Scraper triangular	15 cm	10 Nos
64	Scraper half round	15cm	10 Nos
65	Chisel	cold 9 mm crosscut 9 mm diamond.	10 Nos
106	Steel Rue	60 cm.	10 Nos
107	Vernier Caliper	0- 15 cm	10 Nos
108	Micrometer outside.	0 – 50 mm	10 Nos
109	Micrometer Inside	0 to 20 mm	10 Nos

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. Laptop
2. Whiteboard and Markers
3. Projector
4. Screen
5. Stationary

Annexure 3: 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)

Annexure 4: 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

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

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.
2.

Content availability for previous versions of qualifications:

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

Languages in which Content is available:

Annexure 5: 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 6: 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
Comply with workshop health and safety guidelines	PC 1. Comply with safety, health, security and environment related regulations/ guidelines as per organizational/ manufacturer's policy.				
	Total Marks	2	4		3
Understand and apply the principles of basic engineering design, mathematics, measurement systems, tools and techniques, machining processes, and industrial materials.	PC 1. Fractions, Decimals, Cartesian Geometry and Order of Operations on Conversions from Metric to Imperial and vice versa, Reading Instruments like Vernier Calipers, Micrometer, Height Gauge, etc.				
	PC 1. Exercises on Drilling, Reaming, Tapping, Turning, facing, grooving, parting, Threading.				
	PC 2. Exercises on various types of material used in industries.				
	Total Marks	2	4		3
Understand manufacturing drawings, GD&T, manufacturing processes, and recognize the importance of quality in manufacturing.	PC 1. Exercises on reading component drawings				
	PC 2. Exercises on GD&T				
	Exercises on different Engineering Materials & their properties.				
	PC 3. Exercises on how to cycle various operations like boring, turning, threading etc.				
	PC 4. Exercise on product surface quality by selecting various tool radius & federate.				
	Total Marks	2	4		3
Understand the operation of a CNC milling machine, including worktable coordinates, tool changer functions, preparation of cutting fluid concentration, and identification of electrical and pneumatic connections.	PC 1. Safety instruction for working on machines				
	PC 2. Identify the machine components				
	PC 3. Identify the coordinate System				
	PC 4. Perform machine referencing.				
	PC 5. Calculate cutting tool parameters like speed, feed & depth of cut				
	PC 6. Select cutting tools (Inserts)				
	PC 7. Identify the nomenclature of inserts.				
	PC 8. Performing fluid concentration & machine lubrication oils.				
	PC 9. Material Properties.				
	Total Marks	2	4		3
Understand and apply principles of Basics of Engineering Design, Mathematics, system of measurements, Measurements and Tools, Machining, various types of material used in industries.	PC 1. Selection of cutting tools & holders.				
	PC 2. Use of function key on control panel.				
	PC 3. Program Editing and Execution				
	PC 4. Perform tool wear Settings				
	PC 5. Identify tool wear and add or remove machining offset				
	PC 6. Handling of Measuring instruments like Vernier caliper, Micrometer, dial gauge etc.				

	Total Marks	2	4		3
Operate CNC milling using standard procedures and use quality tools to inspect the component.	• PC 1. Use of G Codes and M Codes				
	• PC 2. Use of fixture (Job holding devices).				
	• PC 3. Modes of programme execution. (Single block, dry run, MDI & Auto)				
	• PC 4. Perform Absolute and Incremental program				
	• PC 5. Apply Cutter Compensation and list the importance.				
	• PC 6. Create Interpolation and Canned Cycles				
	• PC 7. Milling machine operating with the help of Standard operating procedure & safety guidelines.				
	Total Marks	2	4		4
Select, edit, and create different programs using G/M codes also use simulator to optimize the tool paths and reduce machining time.	• PC 1. Select, edit and create programs on milling machine.				
	• PC 2. Documentary record of set up change and first piece quality inspection report.				
	• PC 3. Simulate the program tool path.				
	• PC 4. Optimize the tool path.				
	Total Marks	2	4		4
Assignments	• PC1 Based on case studies and Industrial application				
	Total Marks	2	5		6
Mini Projects (Based on case studies and Industrial application)	• PC 1. Machining of Auto Component				
	• PC 2. Case study of tool Room Industry				
	• PC 3. Case study of Mold and Die Industry				
	• PC 4. Machining of Aerospace components.				
	• PC 5. Machining if defense industry component				
	• PC 6. Machining of Heavy equipment Industry				
	• PC 7. General Engineering: Fittings, Fasteners, Pumps & Valves				
	• PC 8. Addressing of nearby machining Industry component				
	Total Marks	2	5		7
Employability Skills	• PC1 Understanding the Significance of Employability skills				
	• PC2 Identification the Constitutional values				
	• PC3 Explaining Becoming a professional in the 21st century				
	• PC4 Speak with Others in Basic English skills				
	• PC5 Significance of Career development and goal setting				
	• PC6 Etiquette of Communication skills				
	• PC7 Use Various Financial and legal literacy				
	• PC8 Awareness to Essential Digital Skills				
	Total Marks	2	2		4
Grand Total		20	40		40

Annexure 7: 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 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 8: 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