



सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
DEVELOPMENT COMMISSIONER
MINISTRY OF MICRO, SMALL & MEDIUM
ENTERPRISES

MSME TECHNOLOGY CENTRE



Skill India
कौशल भारत - कुशल भारत

QUALIFICATION FILE

Sr. Product Manager (Aerospace Manufacturing)

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

Upskilling Dual/Flexi Qualification For To T For To A

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

NCrF/NSQF Level: 6

Submitted by:

MSME TECHNOLOGY CENTRE
O/o DC MSME, Ministry of Micro, Small and Medium Enterprises
Govt. of India
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NSQC Approved

Section 1: Basic Details

1.	Qualification Name	Sr. Product Manager (Aerospace Manufacturing)													
2.	Sector/s	Capital Goods & Manufacturing													
3.	Type of Qualification: <input checked="" type="checkbox"/> New <input type="checkbox"/> Revised <input type="checkbox"/> Has Electives/Options <input type="checkbox"/> OEM	NQR Code & version of existing/previous qualification: <i>(change to previous, once approved)</i> MSME / PGAM / 50	Qualification Name of existing/previous version:												
4.	a. OEM Name b. Qualification Name <i>(Wherever applicable)</i>	NA Sr. Product Manager (Aerospace Manufacturing)													
5.	National Qualification Register (NQR) Code &Version <i>(Will be issued after NSQC approval)</i>	QG-06-CG-02551-2024-V1-MSME	6. NCrF/NSQF Level: 6												
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	After Completion of This Qualification Candidate can be able to <ul style="list-style-type: none"> • Manufacture Aerospace Product • Conduct Quality Assurance as per DGQA • Comply with Quality Audit of Aerospace • Comply as per Product Life Cycle Management 													
9.	Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	a. Entry Qualification & Relevant Experience: Degree in Mechanical /production/Aerospace / Equivalent. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%; text-align: center;">No.</th> <th style="width: 65%;">Academic/Skill Qualification (with Specialization - if applicable)</th> <th style="width: 30%;">Required Experience (with Specialization - if applicable)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Completed BE/B.Tech (Mechanical, Production, Aerospace)</td> <td>Nil</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Previous Relevant Qualification of NSQF Level 5.5</td> <td>1.5</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Previous Relevant Qualification of NSQF Level 5</td> <td>3</td> </tr> </tbody> </table>		No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1	Completed BE/B.Tech (Mechanical, Production, Aerospace)	Nil	2	Previous Relevant Qualification of NSQF Level 5.5	1.5	3	Previous Relevant Qualification of NSQF Level 5	3
No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)													
1	Completed BE/B.Tech (Mechanical, Production, Aerospace)	Nil													
2	Previous Relevant Qualification of NSQF Level 5.5	1.5													
3	Previous Relevant Qualification of NSQF Level 5	3													

		b. Age: 18 Years																												
10.	Credits Assigned to this Qualification, Subject to Assessment(as per National Credit Framework (NCRF))	20	11. Common Cost Norm Category (I/II/III) (wherever applicable): I																											
12.	Any Licensing requirements for Undertaking Training on This Qualification(whenever applicable)	NA																												
13.	Training Duration by Modes of Training Delivery (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)	<input type="checkbox"/> Offline <input type="checkbox"/> Online <input checked="" type="checkbox"/> Blended <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <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>114</td> <td>300</td> <td>150</td> <td></td> <td>564</td> </tr> <tr> <td>Online</td> <td>36</td> <td></td> <td></td> <td></td> <td>36</td> </tr> <tr> <td>Total</td> <td>150</td> <td>300</td> <td>150</td> <td></td> <td>600</td> </tr> </tbody> </table> <p><i>(Refer Blended Learning Annexure for details)</i></p>					Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)	Classroom (offline)	114	300	150		564	Online	36				36	Total	150	300	150		600
Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)																									
Classroom (offline)	114	300	150		564																									
Online	36				36																									
Total	150	300	150		600																									
14.	Aligned to NCO/ISCO Code/s(if no code is available mention the same)	3122.99 (Manufacturing Supervisors, Other)																												
15.	Progression path after attaining the qualification (Please show Professional and Academic progression)	Professional Progress: Sr. Product Manager → Sr. Manager																												
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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No URLs of similar Qualifications:																												
18.	Is the Job Role Amenable to Persons with Disability	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If "Yes", specify applicable type of Disability:																												
19.	How Participation of Women will be Encouraged	Reserved as per gov. norms.																												
20.	Are Greening/ Environment Sustainability Aspects Covered (Specify the NOS/Module which covers it)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No The Concern Module is cover in Quality Management System.																												
21.	Is Qualification Suitable to be Offered in Schools/Colleges	Schools <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Colleges <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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: Sh. Vijay Mahipatrao Bankar Contact No. +0755 3501078 Email-msmetcab@gmail.com																												

23.	Final Approval Date by NSQC: 15.03.2024	24. Validity Duration: 3 years	25. Next Review Date: 15.03.2027
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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/N SQF 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.	Production Process Planning with ERP	MSME/MCCA RM/01	Core	6	5		30	120		150	-	100	-	-	100		
2.	CNC Technology	MSME/MCCA RM/02	Core	6	4	30	90			120	-	100	-	-	100		
3.	Computer Aided Manufacturing	MSME/MCCA RM/03	Core	6	3		90			90	-	100	-	-	100		
4.	Computer Aided Design with Analysis.	MSME/MCCA RM/04	Core	6	3		90			90	-	100	-	-	100		
5.	Understanding & Application of Aerospace Materials	MSME/MCCA RM/05	Core	6	1	30				30	100	-	-	-	100		
6.	QMS & FAI, AS 9100, Quality Control & Inspection	MSME/MCCA RM/06	Core	6	1	30				30	100	-	-	-	100		
7.	Employability Skills	MSME/ES/03	Core	6	3	90				90	100		-	-	100		
Duration (in Hours) / Total Marks						20	180	300	120		600	300	400			700	

Elective NOS/s:

S. No	NOS/Module Name	NOS/Module Code & Version <i>(if applicable)</i>	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 (%) <i>(if applicable)</i>
1.																
2.																
Duration (in Hours) / Total Marks																

Optional NOS/s:

S. No	NOS/Module Name	NOS/Module Code & Version <i>(if applicable)</i>	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 (%) <i>(if applicable)</i>
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: *(Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)*

- Minimum Marks to pass Theory Exam: 40%
- Minimum Marks to pass Practical Exam: 60%

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.)*

- Minimum Marks to pass Theory Exam: 40%
- Minimum Marks to pass Practical Exam: 60%

Section 3: Training Related

1.	Trainer's Qualification and experience in the relevant sector (in years)(as per NCVET guidelines)	Degree / Post Graduate in Mechanical Engineering or Equivalent with Practical skills and knowledge required in the relevant job role at least one level higher i.e. level 6.5 and above in related field and minimum 2 years of experience in Tool Room/ Technology Centre of MSME or any reputed industry will become a trainer, Or in accordance with the TOT guideline of NCVET
2.	Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	Degree / Post Graduate in Engineering (Mechanical/ Production/ Manufacturing Technology) or equivalent with 3 to 5 years of experience in Production/ Training/ Design Department from Tool Room/ Technology Centre of MSME or any reputed industry will become as a Master Trainer, Or in accordance with the TOT guideline of NCVET
3.	Tools and Equipment Required for Training	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If "Yes", details to be provided in Annexure)
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) (as per NCVET guidelines)	Graduate / Post Graduate in the relevant discipline with minimum 3 years of experience in their professional fields (including minimum 2 years of relevant industry experience). Only certified assessors will be able to conduct assessments.
2.	Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Only certified proctors are engaged in the invigilation of assessment.
3.	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Graduate / Post Graduate in the relevant discipline with minimum 5 years of experience in their professional fields (including minimum 3 years of relevant industry experience).
4.	Assessment Mode(Specify the assessment mode)	Blended Type (Online + Offline)
5.	Tools and Equipment Required for Assessment	<input checked="" type="checkbox"/> Same as for training <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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): Yes
2.	Latest Market Research Reports or any other source (not older than 2years) (Yes/No): Yes
3.	Government /Industry initiatives/ requirement (Yes/No): Yes
4.	Number of Industry validation provided: 19
5.	Estimated nos. of persons to be trained and employed: 50
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)	Annexure-I
2.	Annexure: List of tools and equipment relevant for qualification (Mandatory, except in case of online course)	Annexure-II
3.	Annexure: Industry Validations Summary	Annexure-III
4.	Annexure: Training & Employment Details	Annexure-IV
5.	Annexure: Blended Learning (Mandatory, in case selected Mode of delivery is “Blended Learning”)	Annexure-V
6.	Annexure: Detailed Assessment Criteria (Mandatory)	Annexure-VI
7.	Annexure: Assessment Strategy (Mandatory)	Annexure-VII
8.	Annexure: Acronym and Glossary (Optional)	Annexure- VIII
9.	Annexure: Multiple Entry-Exit Details (Mandatory, in case qualification has multiple Entry-Exit)	NA
10.	Supporting Document: Model Curriculum (Mandatory – Public view)	Annexure- IX

11.	Supporting Document: Career Progression (Mandatory - Public view)	<i>This aspect mentioned in point no. 15</i>
12.	Supporting Document: Occupational Map (Mandatory)	<i>Annexure-X</i>
13.	Supporting Document: Assessment SOP (Mandatory)	<i>Annexure- XI</i>
14	Any other document you wish to submit:	<i>NA</i>

Annexure I: 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	<ul style="list-style-type: none"> Design and Development of CAD model using CAD software Analyze and optimize the CAD Design using CAE Software Create tool path using CAM Software Create CNC programming Using Simulator and CNC Machine Execute manufacturing operation using CNC Machine Development of Process sheet using ERP Able to select Material for Aerospace Manufacturing. Able to select proper tools for Aerospace Manufacturing process. 	<p>The Learner Can do the modeling, analysis and manufacturing activities before starting them, use appropriate sources to obtain the required information, access and use the correct modeling, analysis and manufacturing software and tools, check that all the equipment is correctly connected and in a safe and usable working condition, set up the modeling environment and select a suitable template/folder, set the drawing datum at a convenient point to create a modeling template with title, file number, material, date, establish coordinate system, orientation and views as per the job, create entities in 3D space as per job requirement, modify entities in 3D space as per job requirement, analyze and achieve optimum design and result of simulation using CAE Software ,planning the best feasible manufacturing process and tool selection in manufacturing CAM software. Simulate the manufacturing process and plan the process and tool selection. Design or create 3-D views on the screen by manipulating drawing planes and inserting 3-D geometric shapes, identify and use key features of solid modeling, analysis and manufacturing software package to produce reliable model and manufacturing process planning.</p> <p>In this qualification Job Holder has to carry out design and development of CAD model and production using CAD. Which includes Design and development of 2D Component Drawing and 3D Model? Analyze and optimum design using CAE software and CNC program generation using CAM software. Execute machining</p>	6

		<p>process using CNC Machines. Selection of tool for respective material has to machine. Read the production drawing and execute the programming accordingly. Debug the CNC program. Calculation of different machining parameter i.e. feed, depth of cut, tool material, speed, coolant selection etc.</p>	
<p>Professional and Technical Skills/ Expertise/ Professional Knowledge</p>	<ul style="list-style-type: none"> ● Demonstrate & describe the use of CAD software for modeling and Drafting ● Demonstrate & describe the use of CAE software to analyze and optimize a design. ● Describe the use of CAM Software to generate toolpath and CNC program for manufacturing ● Describe the use and work with CNC simulator to generate and simulate the CNC programming. ● Describe the use and work with CNC machine with different controller to execute manufacturing process ● Identify customer’s requirement and create 2D and 3D model using CAD model ● Develop and plan the production Drawing using ERP software ● Analyze and optimize the design using CAE software ● Generate, simulate and modify the tool path and CNC programming using CAM software ● Able to apply or implement the QC tools as per AS 9100C. ● They are able to understand the Bill of Material, Production Order to Delivery of the product, 	<p>Job holder will possess professional knowledge of organizational procedures and information systems for retrieving and storing drawing data, applicable drafting standards/procedures, procedures and need for customizing menus and system defaults, appropriate projection for the drawing purpose, reasons for selecting the chosen projection, reasons for including auxiliary views in drawings, layout and/or assembly drawings, drawing specifications, common symbols used in drawings,</p> <p>Job holder will also have knowledge of types of drawings that may be produced by the software, selection of standard components, functionality of the component being drawn, and its interrelationship with other components and assemblies, how to set up the viewing screen to show multiple views of the drawing to help with drawing creation, standards and conventions that are used for the drawings, how to set up the drawing template parameters, application and use of drawing tools and modeling tools, how to access, recognize and use a wide range of standard components and symbol libraries from the CAD equipment, Job holder will have knowledge of various commands under different toolbars in Sketcher, Solid modeling, surface modeling, Assembly Design and Drafting Environment.</p> <p>Job holder will have the knowledge of FEM/FEA. They will be able to understand the design requirement and knowledge of preprocess, have skills of import the CAD model and clean up geometry, mesh generation, establish the boundary condition as per the design requirement, assigning the material to model establish the factor of safety. Selection of solver during processor, knowledge of post processor. Run the simulation using CAE software,</p>	<p>6</p>

	<p>Having knowledge of Quality assessment and Audit.</p>	<p>Interpretation of result, create the report, and verify the result accordingly optimize design.</p> <p>Job holder will have factual knowledge and skills in CAM programming as well as knowledge of how to apply facts, principles, processes and general concepts in the CAM programming which includes: Knowledge about limitation & advantages of CAM, Use working of CAM software.</p> <p>Create CNC programming and execute CNC machining using different CNC machine and different controller. Knowledge of tool selection, machining parameter and its calculation.</p> <p>Job holder will carry out the design and development of tool through following professional skill: gather accurate information on the requirements of the customer or tool designer, create conceptual design, analysis the design and generate the manufacturing program and execute the program on CNC machine. Confirm the customer's objectives for the engineering products or processes, Using standard unit system as customer's requirement.</p> <p>Job Holder will design and develop CAD model using various CAD software like AutoCAD, UGCAD, and SOLIDWORKS. Job Holder will prepare design standard design and classify the appropriate procedure to Explain various theoretical and practical aspect of analysis of design using CAE Software ANSYS. Job Holder shall develop CAM program using UGCAM etc.</p> <p>Job holder will Plane and execute different types of machining process lathe, milling, grinding on different machine controlled by different type of controller.</p> <p>Job holder will be able to set job, establish coordinate system</p> <p>Learner will able to implement the QC tools as per AS 9100C.</p> <p>Learner will able to implement FAI, Calibration tools , 3D Print and scanning.</p>	
<p>Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill</p>	<ul style="list-style-type: none"> Understand Personal Strengths \ Value, Digital Literacy, Money Matters and Preparing for Employment & Self Employment 	<p>Learner can Develop communication competence, report writing skills & preparation of Resumes or Curriculum Vitae, Learner can be able to Interact</p>	<p>6</p>

	<ul style="list-style-type: none"> • Develop entrepreneurship skills • Exercise self- management within the work contexts 	<p>effectively with co-workers and can apply the Engineering Ethics and Human Values at workplace.</p> <p>Learner can understand the basic process of becoming an entrepreneur & start up and can get benefits from various government schemes applicable.</p> <p>Learner can Analyze and clarify task-related information, Meaning and importance of entrepreneurship, Enterprise Registration, Business Skills - Motivation and Leadership</p> <p>Learner can develop Effective Communication, Interpersonal Relationships, and Compliances & Marketing plan.</p> <p>Learner can do the required Time Management for successful completion of the project & develop Time Management within the team.</p>	
<p>Broad Learning Outcomes/Core Skill</p>	<ul style="list-style-type: none"> • Use basic health and safety practices at the workplace • Work on project • Communicate effectively • Mathematical Calculation skills • Maintain & prepare reports as per standard / check sheet. <p>identify job-site hazardous work and state possible causes of risk or accident.</p>	<p>Job holder shall work on project where he/she shall gather accurate information on project, organize logically. e.g. concept and requirements, Confirm the project objectives, preparation of conceptual plan, selection of CAD/CAM/CAE software based on capabilities of modelling, use Presentation skills, utilize CAD & CAM Software, communicate clearly about the project requirement to the group members through written /verbal/e mail etc. as per organizational standard, identify different design options which will meet requirements and design specification.</p> <p>Job holder will use mathematical calculations while designing and analyzing the CAD model through: calculate stain stress value for standard mechanical component. Calculate the geometry of component on the basis of given parameter. Calculate the bulking stress, calculate the pressure, and calculate the factor of safety. Calculation of machining parameter feed speed, depth of cut, spindle speed.</p> <p>Job holder shall use protective equipment while working on computers and during working on shop floor, wear helmet, state the name and location of people responsible for health and safety in the workplace, state the names and location</p>	<p>6</p>

		<p>of documents that refer to health and safety in the workplace, identify job-site hazardous work and state possible causes of risk or accident.</p> <p>Learners will have the knowledge of evaluating the components with the standards drawing for the given job, Use of GD&T symbols.</p> <p>Learners are capable of taking decision for the quality output and productivity enhancement</p>	
<p>Responsibility</p>	<ul style="list-style-type: none"> Learner is highly skilled in CAD/CAM/CAE & CNC Programming/ERP and responsible for achieving tangible outcomes, managing change, building teams, and mentoring the Co-workers and subordinates & implementing quality tools & Configuration management. 	<p>Learner shall be responsible for own work of design and development of Aerospace component. After completing the concept design & manufacturing work with time line and with job responsibilities of team members like designing and development CAD model, analyze the design, optimize the design and generate production drawing, bill of material, verification and release of final drawings, plan the manufacturing process. Supervise and execute the machining process in shop floor.</p> <p>Learner will encourage team members for continues learning and development by time to time discussing with them various issues of project like tool / die suitability to specified machine, new development in machines, selection of material, new development in the materials and manufacturing processes.</p> <p>Learner will follow work standard, specific norms and procedures laid down by the organization. Job holder will develop moral, values and ethical practices in business operation.</p>	<p>6</p>

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Annexure II: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

Batch Size: 20

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	Conventional Milling	Industry Standard	2
2	Conventional Turning		2
3	Conventional Grinding		1
4	CNC Milling (Multi Axis)		2
5	CNC Turning		2
6	W-EDM		1
7	EDM		1
8	CMM		1
9	Profile Projector		1
10	Micro-height		1
11	CAD-Auto CAD		10 System
12	CAD-Solid Works		10 System
13	CAD-Catia		10 System
14	CAM-MASTER CAM		10 System
15	CAM-Unigraphics/Hypermill /Mastercam		10 System
16	CAE-ANSYS		10 System
17	ERP-Software SAP		3 System
18	All standard measuring instrument		10 Set

Annexure III: 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	MOLDTEK INDIA	Miss. PRIYA	HR	Aditya Enclave, Hyderabad Telangana-33	8143872733	jobs@moldtekindia.com	
2	MIS ANNA BLOCK BORING CENTER	MASIT KHAN	PROPRIETOR	MIS ANNA BLOCK BORING CENTER	9767375083		
3	LAXMI ENTERPRISES	RANJANA BHAYYA SAHEB PAWAR	MI.MANAGER	SAINAGAR GHANEGAON MIDC WALUJ, AURANGABAD	7387431128		
4	M/S HR INDUSTRIES	VASPUT JAUGELE	PROPRIETOR	SAJAPUR, AURANGABAD	9637384737		

5	GAYATRI AUTO COMPONENTS, AURANGABAD	MR. RANJEET METE	MANAGER	AURANGABAD	7385613842	INFO@GAYATRIAUTO.IN	
6	SHARP TOOLS	MAHESH DORLE	SR.MANAGER		9689574563		
7	CHANCHAL ENGINEERING WORKS AURANGABAD	DRYHAEHBWAR	PROPRIETOR	AURANGABAD	9765499939	CHANCHALENGINEERINGWORKS@GMAIL.COM	
8	AKSHARA ENGINEERING WORKS	SHIVAJI GAIKWAD		WALUJ MIDC AURANGABAD	9096420857		
9	SR INDUSTRIES AURANGABAD	RAJENDRA SAUDAGAR MARE	SR. MANAGER	AURANGABAD	8698145607		
10	DEVA ENGINEERING AURANGABAD	ASHOK MOTINAM VEOR	SR. MANAGER	AURANGABAD	8459567793		
11	NAVARATNA INDUSTRIES			WALUJ MIDC AURANGABAD			
12	PRANAW ENTERPRISES AURANGABAD	PANDRINATH DEVKAR	PROPRIETOR	AURANGABAD	9371671146	PRANAVENT@GMAIL.COM	
13	TECHNO MOULD SOLUTION	MR.PANDA	PROPRIETOR	AURANGABAD	7774077907	TECHNOMOULD.SOLUTIONS@GMAIL.COM	
14	SANJAY THCHNO PRODUCTS	HEMANT CHAUDHURY	VP-MANUFACTURING	AURANGABAD	9158898090	HEMANT.CHAUDHARI@SANJAYTECHNO PRODUCTS.IN	
15	SPECIAL PRECISION	ASHIWINI TADHAV	PROPRIETOR	AURANGABAD		SPECIALASHIWINI@GMAIL.COM	
16	INDEXABLE CUTTING TOOL	TOR	PROPRIETOR	BAJAINAGAR,AURANGABAD			
17	INDOTURAN INDUSTRIES	USHAL SHINDE	PROPRIETOR	MIDC AURANGABAD WALUJ	9595280808		
18	CREATIVE CASTING INDUSTRIES	MR. SANJAY RANDIRE	PARTNER	K-30, MIDC WALUJ , AURANGABAD	9011001671	CREATIVECAST@REDIFFMAIL.COM	
19	PYRAMID INDUSTRIES	MR. RAJENDRA KALE	PROPRIETOR	MIS ANNA BLOCK BORING CENTER	9767375083		

Annexure IV: 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
23-24	40	40	3	3	-	-
24-25	60	60	5	5	-	-
25-26	100	100	7	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
1.0	20-21	13	7	6	6	1	1	1	1	-	-	-	-
1.0	21-22	6	5	5	5	2	2	2	1	-	-	-	-
1.0	22-23	6	5	5	5	1	1	1	1	-	-	-	-

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. Fee based Training Program under the Ministry of MSME.

Content availability for previous versions of qualifications:

Participant Handbook Facilitator Guide Digital Content Qualification Handbook Any Other:

Languages in which Content is available:

English

Annexure V: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools:

Sr. Product Manager (Aerospace Manufacturing)

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	<input checked="" type="checkbox"/> Theory/ Lectures - Imparting theoretical and conceptual knowledge	Books/ e-books, Presentations, Reference Material, Audio / Video Modules with 2D and 3D animation Self-Learning Videos /Broadcasts /Mobile Learning /Curated Digital content	40:60
2	<input checked="" type="checkbox"/> Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	Self-Learning Videos, Broadcasts, Mobile Learning, Curated Digital content	40:60
3	<input checked="" type="checkbox"/> Showing Practical Demonstrations to the learners	CNC Simulators/ CAD Software, Video Content, E-Resource library, ERP Software	100:0
4	<input checked="" type="checkbox"/> Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	CNC Simulators, CNC Lathe Machines, Grinding Machines, Measuring, instruments, Cutting Tools, Hand Tools / CAD Software	100:0
5	<input checked="" type="checkbox"/> Tutorials/ Assignments/ Drill/ Practice	Online Question Bank, Mobile Quick test app, MCQ based tests, Practical Test on Machines	40:60
6	<input checked="" type="checkbox"/> Proctored Monitoring/ Assessment/ Evaluation/ Examinations	Assessment engine for Essays, Up-loadable file examinations, Mock test sessions	50:50
7	<input checked="" type="checkbox"/> On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	NA	100:0

Annexure VI: 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
NOS / Module: MSME/MCCARM/01 Production Process Planning with ERP	PC 1. Describe safety rules PC 2. Describe precautions to be taken for safety at work. PC 3. Explain the safety precautions required in the given set of work. PC 4. Explain the use of PPE while working in the workshop. PC 5. Describe the characteristics of the cutting tool materials. PC 6. Describe different types of materials used for cutting tools.	NA	100	NA	NA

<p>PC 7. Identify tool materials and their properties.</p> <p>PC 8. Select tool material for the specific cutting tool application.</p> <p>PC 9. Explain & List different types of lathe machine w.r.t. its specifications.</p> <p>PC 10. Identify major parts and mechanism used in lathe</p> <p>PC 11. Explain the various lathe operation</p> <p>PC 12. Explain the parts and its function of milling machine.</p> <p>PC 13. Explain the parts and its function of grinding machine.</p> <p>PC 14. Explain engineering material with its type</p> <p>PC 15. Describe the various property of material such as Mechanical, Electrical, magnetic, Chemical, Optical, Physical.</p> <p>PC 16. Describe mechanical property of material such as 1. Strength, 2. Elasticity, 3. Plasticity, 4. Stiffness, 5. Resilience, 6. Toughness, 7. Ductility, 8. Malleability, 9. Hardness. 10. Brittleness, 11. Creep and 12, Fatigue</p> <p>PC 17. Explain the Engineering application of Tool material</p> <p>PC 18. Describe Metals: ferrous & nonferrous.</p> <p>PC 19. Explain Ferrous materials: Contain Iron as base.</p> <p>PC 20. Describe Ferrous Metals & their alloys extensively used in Metallurgical and mechanical Industries for shaping the products.</p> <p>PC 21. Nonferrous materials: Aluminum, Copper, Lead, Zinc, Tin, Nickel, Magnesium</p> <p>PC 22. Write the factors consider in selection of material.</p> <p>PC 23. Compare ferrous material with non-ferrous material.</p> <p>PC 24. Identify the type of material (ferrous or non-ferrous)</p> <p>PC 25. Describe the use of iron: Pig Iron, wrought iron, cast iron</p> <p>PC 26. Describe the use of Steel: low carbon, high carbon, medium carbon, Alloy Steel.</p> <p>PC 27. Describe the steel making process & iron carbon diagram.</p> <p>PC 28. Describe the purpose of heat treatment of steel</p> <p>PC 29. PC.29 Explain the different heat treatment process such as Annealing, Stress relieving, Refining, Normalizing, Tempering and Hardening</p> <p>PC 30. Overview of SAP Business one</p> <p>PC 31. Concept of Master Data and Documentation</p>				
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	<p>PC 32. Explain the concept of Resources</p> <p>PC 33. Concept of Inventory Management</p> <p>PC 34. Concept of Production Planning</p> <p>PC 35. Explain the MRP Concept</p>				
<p>NOS / Module:</p> <p>MSME/MCCARM/02</p> <p>CNC Technology</p>	<p>PC 1. Plan the machining activities before starting them.</p> <p>PC 2. Use appropriate sources to obtain the required information e.g. Numerical control on CNC machine, types of CNC control</p> <p>PC 3. Calculation of technological data for CNC machining.</p> <p>PC 4. Check that all the equipment is correctly connected and in a safe and usable working condition</p> <p>PC 5. Select Appropriate Raw Material as per size of the Parts to be manufactured mentioned in drawing and specification</p> <p>PC 6. Calculate parameters like speed feed, depth of cut etc. and set a references for the various operations</p> <p>PC 7. Use appropriate techniques to create CNC program that are sufficiently and clearly detailed</p> <p>PC 8. Use codes and other references that follow the required conventions</p> <p>PC 9. Make sure that programs are checked and approved by the appropriate person</p> <p>PC 10. Save the program in the appropriate file type and location</p> <p>PC 11. Deal promptly and effectively within your control, and seek help and guidance from the relevant people if you have problems that you cannot resolve</p> <p>PC 12. Prepare correct programs, demonstrate, simulate and operate CNC lathe / milling / EDM / WEDM machines for various machining operations.</p> <p>PC 13. Describe and explain Modern CNC systems and explain its importance in manufacturing.</p> <p>Execute program and inspect simple geometrical forms / standard parts.</p>	NA	100	NA	NA
<p>NOS / Module:</p> <p>MSME/MCCARM/03</p> <p>Computer Aided Manufacturing</p>	<p>PC 1. Calculate parameters like speed feed, depth of cut etc. And set a references for the various operations</p> <p>PC 2. Create / import entities in 3D space as per job requirement</p> <p>PC 3. Modify entities in 3D space as per job requirement</p> <p>PC 4. Create 3-D views on the screen by manipulating drawing planes and inserting 3-D geometric shapes</p> <p>PC 5. Perform programming for solid modeling</p>	NA	100	NA	NA

	<p>PC 6. Produce a model for export to the following manufacturing systems Manufacturing systems: DNC (Direct Numerically controlled) /CNC (Computer Numerically controlled) machines; 3D printer; other specific system</p> <p>PC 7. Produce CAM program which comply with organizational guidelines; statutory regulations and codes of practice; CAM software standards; national and international standards</p> <p>PC 8. Confirm that the program is as per job specifications and contains all relevant information</p> <p>PC 9. Use appropriate techniques to create program that are sufficiently and clearly detailed</p> <p>PC 10. Use codes and other references that follow the required conventions</p> <p>PC 11. Make sure that programs are checked and approved by the appropriate person</p> <p>PC 12. Save the program in the appropriate file type and location.</p> <p>PC 13.</p>				
<p>NOS / Module:</p> <p>MSME/MCCARM/04</p> <p>Computer Aided Design with Analysis.</p>	<p>PC 1. Explain the Importance of Engineering drawing,</p> <p>PC 2. Explanation the scope and objective of Engineering Drawing</p> <p>PC 3. Demonstrate and explain drawing Standards: Size of drawing sheets – Layout of drawing sheet – Title Blocks – Types of lines – Folding of drawing sheets.</p> <p>PC 4. Use of dimensioning techniques according to Standard of dimensions</p> <p>PC 5. Demonstrate orthographic & Isometric projection by using a viewing box and a model</p> <p>PC 6. Demonstrate first angle and third angle projection</p> <p>PC 7. Use of symbol in projections -Front view, top view and side view</p> <p>PC 8. Demonstrate the use of CAD and CAD interface (AutoCAD, Catia, Solidworks)</p> <p>PC 9. Apply coordinates systems in CAD</p> <p>PC 10. Demonstrate the use of tool bars.</p> <p>PC 11. Create solid field area (Hatching, Gradient)</p> <p>PC 12. Edit objects using the object property tool bar and various methods.</p> <p>PC 13. Use sketch settings and Style toolbar (text style, Multileader style etc.)</p> <p>PC 14. Edit object using object property toolbar & various method.</p> <p>PC 15. Create the replica of model using copy, array command</p> <p>PC 16. Work with models in the modify toolbar.</p> <p>PC 17. Identify the appropriate Tool to create and modify the model</p>	<p>NA</p>	<p>100</p>	<p>NA</p>	<p>NA</p>

PC 18. Change the orientation of the object by aligns, offset, rotate command				
PC 19. Apply standard dimension in a mechanical component.				
PC 20. Use of dimensioning Methods: Linear, Align, ordinates, Radius, Diameter, Arc length, angular etc,				
PC 21. Use of leader with text, block reference				
PC 22. Edit or modify the CAD Drawings				
PC 23. Use of layers Management and its applications				
PC 24. Apply GD& T Symbols in drawings				
PC 25. Develop proper drawing layout.				
PC 26. Use of Surfacing in Cad				
PC 27. Use of sheet metal in cad				
PC 28. Explain & Demonstrate the Assembly module in CAD				
PC 29. Explain the interference Clash and parameterizations analysis				
PC 30. Understand the need Analysis and need of CAE Software				
PC 31. Different file format use in CAE Software				
PC 32. Export and Import of different file format in CAE				
PC 33. Define the different parameter for analysis				
PC 34. Generate the mesh file				
PC 35. Define the load and boundary parameter for the CAD model				
PC 36. Simulate the result				
PC 37. Validate the result				
PC 38. Optimize the result				
PC 39. Generate the macro file for the analysis				
PC 40. Generate the different types of graphs				
PC 41. Publish the graphs				
PC 42. Generate the report.				

<p>NOS / Module: MSME/MCCARM/05 Aerospace Materials</p>	<p>PC 1. Explain the classification of aerospace material PC 2. Categorize of Alloying elements PC 3. Explain the different heat treatment process PC 4. Explain the concept of Microstructures of materials PC 5. Explain the concept of Materials failure analysis PC 6. Explain the surface treatment, procedure treatment, solution treatment and precipitation hardening. PC 7. Explain the NDT, Surface Coating and Cleaning</p>	<p>100</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>
<p>NOS / Module: MSME/MCCARM/06 QMS & FAI, AS 9100, Quality Control & Inspection</p>	<p>PC 1. Explain the Concept of 7QC Tools PC 2. Explain the document procedure required for FAI PC 3. Explain the document procedure required for AS Standard PC 4. Importance of different inspection tools for precision manufacturing or Aerospace manufacturing PC 5. Explain the concept of Total Quality Managements PC 6.</p>	<p>100</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>
<p>NOS / Module: MSME/ES/03 Employability skills</p>	<p>PC 1. Discuss the Employability Skills required for jobs in various industries PC 2. List different learning and employability related GOI and private portals and their usage PC 3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen PC 4. Show how to practice different environmentally sustainable practices. PC 5. Discuss importance of relevant 21st century skills. PC 6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.</p>	<p>100</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>

PC 7.	Describe the benefits of continuous learning.			
PC 8.	Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone			
PC 9.	Read and interpret text written in basic English			
PC 10.	Write a short note/paragraph / letter/e -mail using basic English			
PC 11.	Create a career development plan with well-defined short- and long-term goals			
PC 12.	Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.			
PC 13.	Explain the importance of active listening for effective communication			
PC 14.	Discuss the significance of working collaboratively with others in a team			
PC 15.	Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD			
PC 16.	Discuss the significance of escalating sexual harassment issues as per POSH act.			
PC 17.	Outline the importance of selecting the right financial institution, product, and service			
PC 18.	Demonstrate how to carry out offline and online financial transactions, safely and securely			
PC 19.	List the common components of salary and compute income, expenditure, taxes, investments etc.			
PC 20.	Discuss the legal rights, laws, and aids			
PC 21.	Describe the role of digital technology in today's life			
PC 22.	Demonstrate how to operate digital devices and use the associated applications and features, safely and securely			
PC 23.	Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely			
PC 24.	Create sample word documents, excel sheets and presentations using basic features			

PC 25.	utilize virtual collaboration tools to work effectively			
PC 26.	Explain the types of entrepreneurship and enterprises			
PC 27.	Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan			
PC 28.	Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement			
PC 29.	Create a sample business plan, for the selected business opportunity			
PC 30.	Describe the significance of analyzing different types and needs of customers			
PC 31.	Explain the significance of identifying customer needs and responding to them in a professional manner.			
PC 32.	Discuss the significance of maintaining hygiene and dressing appropriately			
PC 33.	Create a professional Curriculum Vitae (CV)			
PC 34.	Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively			
PC 35.	Discuss the significance of maintaining hygiene and confidence during an interview Perform a mock interview			
PC 36.	List the steps for searching and registering for apprenticeship opportunities			
Grand Total		500	300	
		1000	800	

Annexure VII: 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 the MSME NSQF Assessment Agency via email for the assessment.
- MSME NSQF Assessment Agency sends the assessment confirmation to respective TC.
- MSME NSQF Assessment Agency deploys the certified Assessor for executing the assessment at respective TC via online / offline mode.
- MSME NSQF Assessment Agency & respective TC Internal Assessment cell monitors the assessment process & records.

2. Testing Environment:

- MSME NSQF Assessment Agency confirms the Assessment location, date and time
- For number of candidates more than 30 separate assessors are assigned for the assessment.
- MSME NSQF Assessment Agency & respective assessor confirms that the allotted time to the candidates to complete Theory & Practical Assessment is correct.

3. Assessment Quality Assurance levels/Framework:

- Each TC Submits the Question Bank for the individual subject Theory & Practice separately, submits to MSME NSQF Assessment Agency and it is verified by the MSME NSQF Assessment Agency Committee members.
- Questions are mapped to the specified assessment criteria
- All the assessors & Trainers are well qualified & trained to carry out the specified task.

4. Types of evidence or evidence-gathering protocol:

- Online Link is send by MSME NSQF Assessment Agency to respective TC & Assessor. Reporting of the assessor from assessment location is verified by the MSME NSQF Assessment Agency through the online Meeting Link. Students are also required to join for the online link for verification by the MSME NSQF Assessment Agency.
- Assessment Photographs are shared with the MSME NSQF Assessment Agency & are also with the respective TC.

5. Method of verification or validation:

- Online Link is send by MSME NSQF Assessment Agency to respective TC & Assessor. Reporting of the assessor from assessment location is verified by the MSME NSQF Assessment Agency through the online Meeting Link. Students are also required to join for the online link for verification by the MSME NSQF Assessment Agency.

6. Method for assessment documentation, archiving, and access:

- The Assessment records are shared with MSME NSQF Assessment Agency & also stored at respective TC.

- Assessor fills the assessment report and shares with the MSME NSQF Assessment Agency.

On the Job Training:

- Each module will be assessed separately.
- The candidate must score 60% marks to successfully complete the OJT.
- Learner will be assessed on the basis of OJT report followed by Viva
- Assessment will ensure that the Learner is able to:
 - ✓ Effective engagement with the customers / Subordinates and team
 - ✓ Understand the working of various tools and equipment
 - ✓ Understand the working environment of the industry

Annexure VIII: 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
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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

NSQC Approved