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

MSME TECHNOLOGY CENTRE

QUALIFICATION FILE

Jr. TECHNICIAN (PCB FABRICATION)

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

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

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

NCrF/NSQF Level: 3.0

Submitted By:

MSME TECHNOLOGY CENTRE

O/o DC MSME, Ministry of Micro, Small and Medium Enterprises

Govt. of India

A-Wing, 7th Floor, Nirman Bhawan, Maulana Azad Road

New Delhi-110108

Contact No. +91-674-2654700

Email- msmetcab@gmail.com

Table of Contents

Section 1: Basic Details

1.	**Qualification Name**	**Jr. TECHNICIAN (PCB FABRICATION)**	
2.	**Sector/s**	**Electronics & HW**	
3.	**Type of Qualification: ☒ New ☐ Revised ☐ Has Electives/Options** **☐OEM**	**NQR Code & version of existing/previous qualification:** *(change to previous, once approved)* QG-03-EH-02381-2024-V1-MSME	**Qualification Name of existing/previous version:** **PCB Design & Manufacturing (PCBD)**
4.	**a. OEM Name** b. **Qualification Name** (*Wherever applicable)*	**NA** -	
5.	**National Qualification Register (NQR) Code & Version** (*Will be issued after NSQC approval)*	QG-03-EH-02381-2024-V1-MSME	**6. NCrF/NSQF Level: 3.0**
7.	**Award (Certificate/Diploma/Advance Diploma/Any Other)** *(Wherever applicable specify multiple entry/exits also & provide details in annexure)*	**Certificate**	
8.	**Brief Description of the Qualification**	After attaining this qualification, Learners shall be able to: • Carry out assemble of upto 2 sides PCB given in the circuit and PCB requirements. • Carry out card copy of PCB. • Work as PCB fabricator and assist in design and Manufacturing of PCB • Start their own PCB repair workshop with opting his carrier option as self-employment	
9.	**Eligibility Criteria for Entry for Student/Trainee/Learner/Employee**	a. Entry Qualification & Relevant Experience: **S. No.** | **Academic/Skill Qualification (with Specialization - if applicable)** | **Required Experience (with Specialization - if applicable** 1 | Grade 10 pass | No experience required 2 | Grade 8 pass with two year of (NTC/ NAC) after 8th | No experience required 3 | Previous relevant Qualification of NSQF Level 2.5 | 1.5 year relevant experience **b. Age:** 15 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***(wherever 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)*	**☐ Offline ☐ Online ☒ Blended**

Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)
Classroom (offline)	53	380	60	-	493
Online	107	-	-	-	107
Total	160	380	60	-	600

(Refer Blended Learning Annexure for details)

14.	**Aligned to NCO/ISCO Code/s***(if no code is available mention the same)*	**8212.27 (PCB Assembly Operator)**
15.	**Progression path after attaining the qualification** *(Please show Professional and Academic progression)*	***Professional/Career Progress:*** Jr. Technician (PCB Fabricator) ➔ Technician (PCB Fabricator) **Academic *Progress:*** Asst. Programmer (Embedded System)
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: as per government norms**
19.	**How Participation of Women will be Encouraged**	**Seats are reserved as per government Norms.**
20.	**Are Greening/ Environment Sustainability Aspects Covered** *(Specify the NOS/Module which covers it)*	**☒ Yes ☐ No** **The said aspect Covered in the module name Employability Skills**
21.	**Is Qualification Suitable to be Offered in Schools/Colleges**	**Schools: ☐ Yes ☒ No Colleges: ☐ Yes ☒ No** Subject to availability of resources.
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:30.04.2024**	**24. Validity Duration: 3 years** / **25. Next Review Date: 30.04.2027**

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	Acquire the concepts of Basic Electronics	MSME/CCPCBF /01	Core	3.0	3	90	-	-	-	90	100	-	-	-	100	
2	Designing of PCB using CAD/CAM software	MSME/CCPCBF /02	Core	3.0	7	20	170	20	-	210	-	100	-	-	100	
3	Prepare for Image Transfer Technique	MSME/CCPCBF /03	Core	3.0	5	10	120	20	-	150	-	100	-	-	100	
4	Perform Mechanical & Chemical Operation to Manufacture PCB	MSME/CCPCBF /04	Core	3.0	4	10	90	20	-	120	-	100	-	-	100	
5	Employability Skills	MSME/ES/01	Non-Core	3.0	1	30	-	-	-	30	100	-	-	-	100	
Duration (in Hours) / Total Credit / Marks					**20**	**160**	**380**	**60**	**-**	**600**	**200**	**300**	**-**	**-**	**500**	

Elective NOS/s:

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

Optional NOS/s:

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

Assessment - Minimum Qualifying Percentage:

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)*	Diploma/Degree in Electronics/Electrical Engineering or equivalent with Practical skills and knowledge required in the relevant job role at least one level higher i.e level 3.5 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 in Electronics/Electrical Engineering 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**	☒ Yes ☐No (*If "Yes", details to be provided in Annexure)*
4.	**In Case of Revised Qualification, Details of Any Upskilling Required for Trainer**	Yes

Section 4: Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Diploma/Degree in Electronics/Electrical Engineering or equivalent with 3 years of experience in Production/Training/Design Department from Tool Room/Technology Centre of MSME or any reputed industry. Only (ToA) certified assessors will be able to conduct the assessments.
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Degree in Electronics/Electrical Engineering or equivalent with 5 years of experience in Production/Training/Design Department from Tool Room/Technology Centre of MSME or any reputed industry.
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Post Graduate in the relevant discipline with minimum 5 years of experience in Production/Training/Design Department from Tool Room/Technology Centre of MSME or any reputed industry.

4.	**Assessment Mode** *(Specify the assessment mode)*	**Blended Type (Online+Offline)**
5.	**Tools and Equipment Required for Assessment**	Same as for training ☒ Yes ☐ No *(details to be provided in Annexure-if it is different for Assessment)*

Section 5: Evidence of the need for the Qualification

Provide Annexure/Supporting documents name.

1.	**Latest Skill Gap Study (not older than 2 years) (Yes/No): Yes,** India Skills Report 2023, "Roadmap to India's Skills and talent Economy 2030" ➔ "IT Sector/ Electronics"
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:** 44
5.	**Estimated nos. of persons to be trained and employed:** Approx. 500 per year
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)*	*This aspect mentioned in point no. 15*
12.	**Supporting Document:** Occupational Map *(Mandatory)*	*Annexure-X*
13.	**Supporting Document:** Assessment SOP *(Mandatory)*	*Annexure- XI*

14.	Any other document you wish to submit:	*NA*

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	Able to draw schematics, convert schematics to layout. Do pre-production planning, printing, CNC operator, quality inspector, production job in a fixed timeline.	A PCB designer needs to do the following jobs in CNC operation, printing, production planning. As such this job requires work in familiar situation of clear choice of procedures.	3
Professional and Technical Skills/ Expertise/ Professional Knowledge	Designing single/double side PCB. CNC programming. Routing techniques. Planning.	The design and manufacturing of a PCB takes shape after a lot of sequences of process. The trained candidate has to have factual knowledge of these processes and has to apply this knowledge in each and every step of the design and production.	3

Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	Screen printing. Plating. Manual drilling. Inspection. Photo tooling.	Though the design of a PCB is not a routine and repetitive job, the work of a PCB designer and manufacturer is more or less repetitive. This is more evident in production related jobs where a job holder goes through the same set of activities on a regular basis. The job holder has to be aware and conscious about quality concepts as it is the quality of the final products which brings satisfaction to the customer. There are a lot of tools and equipments which comes into use during the manufacturing process. One has to be skilled enough to handle various tools and equipments used during these processes. On the other hand the designer has to follow design rule and conditions.	3
Broad Learning Outcomes/Core Skill	Do mathematical calculations. Collect information from customer. Identify, select and maintain various tools. Handle tools and equipments appropriately.	The PCB designer has to understand the design and the design requirements from the customer. The communication between customer and designer can happen face to face or via electronic means. For this one has to have good communication skills. To be able to visit the customers and venders place on has to be aware of the social, political and natural environments.	3
Responsibility	Responsible for his own and learning. Learner also has to take some responsibility of the work of his team and improve their learning.	A PCB in its final product form has come through a lot of processes. The person who works in such a manufacturing line is responsible for his own work so that the overall production is not affected. The industry is ever evolving and a technology becomes obsolete in a few years. Hence one has to be constantly willing to adapt to such changes.	3

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

List of Tools and Equipment for Batch Size: 20

S. No.	Tools / Equipment Name	Specification	Quantity for specified Batch size
1	Computer	Industry Standard	5
2	Laser Jet Printer		1
3	Photo Plotter		1
4	UV Exposing Machine (Screen Printing)		1
5	UV Exposing Machine (Photo Printing)		1
6	Developer Machine		1
7	Dryer		1
8	Double sided film Laminator		1
9	CNC Drilling Machine		1
10	Manual Drilling Machine		1
11	Sharing (Cutting) Machine		1
12	Oven		1
13	Plating Line		1
14	V Groving		1
15	BBT Machine		1
16	HAL		1

17	Brushning Machine		1
18	Etching Machine		1
19	Etching Chemicals		As per machine requirement
20	Roller Tinning		1
21	Plastic Trays		5
22	Aluminum squeegee		5
23	Screen Frames (Different Size)		1
24	Screen Printing Machine		1
25	Optical Magnifier Table		1
26	Yellow Light Inspection Table		1
27	Micrometer		1
28	Vernier Caliper		1
29	Pad Measuring Pins (0.5mm to 2.0mm)		1
30	Ruller		2
31	Multimeter		2
32	PCB tray storage		5
33	Tweezer		2
34	Lith Film		1 Roll

35	Lith film Developer Chemical		1 Packet
36	Fixer Chemical		1 Packet
37	Printing inks (Circuit Print, Masking, Legend Printing)		01(Each)
38	Rubber Gloves		05 pairs

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	DIGITECH CONTROLS & SYSTEMS	MR. AJIT GATE	CEO-FOUNDER	NDA RD, PANDURANG INDUSTRIAL AREA, SHIVANE, PUNE, MAHARASHTRA 411023	9850621072	DIGITECHCONTROLSYSTEMS@GMAIL.COM	
2	ELETECH LAB INSTRUMENT	KRISHAN KUMAR	PROPRIETER	1190, 1ST FLOOR, BENGALI MOHALLA, AMBALA CANTT-133001, HARYANA	9034101751	INFOELETECHAMBALA@GMAIL.COM	
3	ELTKO LABS PRIVATE LIMITED	KRISHAN KUMAR	DIRECTOR	615, UNNAMED ROAD, RAM KRISHAN COLONY, AMBALA CANTT-133001	9034101751	ELTKOLABS@GMAIL.COM	
4	EURON COMMUNICATIONS PRIVATE LIMITED,	ASHOK VERMA	DIRECTOR	PLOT NO. - 2, OASIS CITY GANGAPUR ROAD, RUDRAPUR, U.S. NAGAR (UTTARAKHAND).	8171717155	EURONCOMMUNICATIONS@GMAIL.COM	
5	HI TECH SYSTEM	NAVNEET AGGARWAL	PROPRIETOR	1217/18, OUTER LARGE ROAD, AMBALA CANTT - 133001, HARYANA	9034184735	SALES.HITECHSYSTEM@GMAIL.COM	
6	MASCOT FASTNERS PVT LTD	PANKAJ DAS	ACCOUNT	PLOT NO B-155, ESIPL, SITARGANJ	7500878668		
7	SAVI INDUSTRIAL CORPORATION	ASHISH KUMAR SHRIVASTAVA	PROPRIETER	PLOT NO; 156, LUXMAN GANJ, MLPH, JHANSI, UP-284001	9625773577	SICINDIA2022@GMAIL.COM	

8	SHRIRAM SOLVENT EXTRACTION PRIVATE LTD	SURENDRA KUMAR	MANAGER	VILL-DHYANNAGAR, KASHIPUR ROAD JASPUR (U.S NAGAR), UTTARAKHAND-244712	9837457434	SURENDRAKUMAR@SRSE.IN	
9	B. L. AGRO INDUSTRIES LTD	ASHISH KUMAR SAXENA	CHIEF MANAGER	PARSAKHERA, BAREILLY	9258211462	5S@BLAGRO.ORG	
10	SURAJ TOOLS AND ENGINEERING WORKS	DEIM	CEO	MIDC CHIKATHANA AURANGABAD	7447375273	SURAJTOOLS@GMAIL.COM	
11	INDOTURAN INDUSTRIES	USHAL SHINDE	PROPRIETOR	MIDC AURANGABAD WALUJ	9595280808		
12	MIKRONIX GAUGES PVT LTD		MD	B-25 MIDC, CHIKALTHANA, CH. SAMBHAJINAGAR	9822004674	MGPLAY@GMAIL.COM	
13	ALLWIN UNITED ASSOCIATION PVT.LTD	MI PANKAJ	DIRECTOR	ALLWIN UNITED ASSOCIATION PVT.LIMITED	7588537412	CONTACT@TECHNOCADDAPL.COM	
14	MIS ANNA BLOCK BORING CENTER	MASIT KHAN	PROPRIETOR	MIS ANNA BLOCK BORING CENTER	9767375083		
15	LAXMI ENTERPRISES	RANJANA BHAYYA SAHEB PAWAR	MI.MANAGER	SAINAGAR GHANEGAON MIDC WALUJ, AURANGABAD	7387431128		
16	M/S HR INDUSTRIES	VASPUT JAUGELE	PROPRIETOR	SAJAPUR, AURANGABAD	9637384737		
17	GAYATRJ AUTO COMPONENTS, AURANGABAD	MR. RANJEET METE	MANAGER	AURANGABAD	7385613842	INFO@GAYATRIAUTO.IN	
18	SHARP TOOLS	MAHESH DORLE	SR. MANAGER		9689574563		
19	CHANCHAL ENGINEERING WORKS AURANGABAD	DRYHAEBHWAR	PROPRIETOR	AURANGABAD	9765499939	CHANCHALENGINEERINGWORKS@GMAIL.COM	
20	AKSHARA ENGINEERING WORKS	SHIVAJI GAIKWAD		WALUJ MIDC AURANGABAD	9096420857		
21	ARUSHI ENGINEERING AND BREEZING	VIJAYA PARADE	MANAGER	WALUJ MIDC AURANGABAD	9049596736		
22	SR INDUSTRIES AURANGABAD	RAJENDRA SAUDAGAR MARE	SR. MANAGER	AURANGABAD	8698145607		

23	DEVA ENGINEERING AURANGABAD	ASHOK MOTINAM VEOR	SR. MANAGER	AURANGABAD	8459567793		
24	MAULI PATTERN AURANGABAD	MR. PANCHAL	PROFESSOR	AURANGABAD	9673067755		
25	NAVARATNA INDUSTRIES			WALUJ MIDC AURANGABAD			
26	PRANAW ENTERPRISES AURANGABAD	PANDRINATH DEVKAR	PROPRIETOR	AURANGABAD	9371671146	PRANAVENT@GMAIL.COM	
27	R.P INDUSTRIES	PRASHANT PATIL	CEO	MIDC CHIKATHANA AURANGABAD	8007222251	PRASHANTPATIL@GMAIL.COM	
28	TECHNO MOULD SOLUTION	MR. PANDA	PROPRIETOR	AURANGABAD	7774077907	TECHNOMOULD.SOLUTIONS@GMAIL.COM	
29	SANJAY THCHNO PRODUCTS	HEMANT CHAUDHURY	VP-MANUFACTURING	AURANGABAD	9158898090	HEMANT.CHAUDHARI@SANJAYTECHNOPRODUCTS.IN	
30	SPECIAL PRECISION	ASHIWINI TADHAV	PROPRIETOR	AURANGABAD		SPECIALASHIWIN@GMAIL.COM	
31	PARASON MACHINERY (INDIA) PVT LTD	GHAHU	GM	AURANGABAD	9325202860	AMOIL.MOGAL@PASASEN.COM	
32	PADMA INDUSTRIES	VITTHALKADOM	CEO	MIDC AURANGABAD	9421688212	VITTHALKADOM2525@GMAIL.COM	
33	VANI ENGINEERING CO. PVT LTD	SUBH	GENERAL MANAGER	AURANGABAD	9730729991	SKAPE@GMAIL.COM	
34	GLANCE ENGINEERING -6 PVT.LIMITED CHIKALTHANA	SUBH SK	GENERAL MANAGER	CHIKALTHANA	9730729991	S.KALE@GMAIL.COM	
35	JAI BHAVANI ENGINEERING WORKS		GENERAL MANAGER		9370251815		
36	S N ENGINEERING WORKS	SNEHA	CEO	CH SAMBHAJINAGAR	9822859974	SNEHAG858@GMAIL.COM	
37	R N INDUSTRIES	TLC	CEO	KAIAGRAM, AURANGABAD	9890718928	R.N.INDUSTRIES01@GMAIL.COM	
38	MADURA DIE CAST PVT LIMITD	MADHURA	CEO	SHENDRA AURANGABAD	9422204622	MADHRADIECAST@GMAIL.COM	
39	SWAGATI ENGINEERING WIS2		CEO	CHIKALTHNA, AURANGABAD	9763714369	SWAGATIENGG@GMAIL.COM	
40	IDEAL ENTERPRISE		GENERAL MANAGER	CHIKALTHANA AURANGABAD	9763785199	IDEAL1993@GMAIL.COM	

41	INDEXABLE CUTTING TOOL	TOR	PROPRIETOR	BAJAJNAGAR, AURANGABAD			
42	CREATIVE CASTING INDUSTRIES	MR. SANJAY RANDIRE	PARTNER	K-30, MIDC WALUJ, AURANGABAD	9011001671	CREATIVECAST@REDIFFMAIL.COM	
43	PYRAMID INDUSTRIES	MR. RAJENDRA KALE	PROPRIETOR				
44	RMG INDUSTRIES	RAOUAL	CEO	MIDC AURANGABAD WALUJ	9766699611	EAJUQANDA@RMGINDUSTRIES.COM	

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
2023-24	500	400	50	40	0	0
2024-25	750	600	75	60	0	0

2025-26	1000	800	100	80	0	0

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	2020-21	0	0	0	0	0	0	0	0	0	0	0	0
1.0	2021-22	2	2	2	2	0	0	0	0	0	0	0	0
1.0	2022-23	3	3	3	3	1	1	1	1	0	0	0	0

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 are available:

English

Annexure V: 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/wp-content/uploads/2023/01/Guidelines-for-Blended-Learning-for-Vocational-Education-Training-Skilling.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	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	☒ Imparting Soft Skills, Life Skills, and Employability Skills/Mentorship to Learners	Self-Learning Videos, Broadcasts, Mobile Learning, Curated Digital content	40:60
3	☒ Showing Practical Demonstrations to the learners	PCB, Photo Plotter, UV Exposing Machine (Screen Printing), UV Exposing Machine (Photo Printing), Soldering Kit, Drilling Machine, Video Content, E-Resource library	100:0
4	☒Imparting Practical Hands-on Skills/Lab Work/Workshop/Shop floor training	PCB, Photo Plotter, UV Exposing Machine (Screen Printing), UV Exposing Machine (Photo Printing), Soldering Kit, Drilling Machine	100:0
5	☒Tutorials/Assignments/Practice	Online Question Bank, Mobile Quick test app, MCQ based tests, Practical Test on Equipment	40:60
6	☒Proctored Monitoring/Assessment/Evaluation/Examinations	Assessment engine for Essays, Up-loadable file examinations, Mock test sessions	50:50
7	☒On the Job Training (OJT)	Live Project on PCB Machines, Measuring Instruments at concern Industry/Institution	NA

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/EET/01** Acquire the concepts of Basic Electronics	PC.1 Follow safety rules. PC.2 Lab Safety procedure. PC.3 Lab accidents and precautions. PC.4 Explain structure of matters. PC.5 Explain the working principles of cells and batteries. PC.6 Calculate the value of resistance with the colour code. PC.7 Explain semi-conductor theory. PC.8 Explain working principal of diode and its uses. PC.9 Explain working principal of transistor and its uses. PC.10 Test the electronic component as per its specifications. PC.11 State the need and importance of symbols. PC.12 Draw and identify the symbols for components and instrument used in electronic assembly. PC.13 Use of various electronic instruments. PC.14 Explain the binary number system. PC.15 Convert number from one number system to other. PC.16 Explain the logic families (Nomenclature and brief features). PC.17 Identify different packaging system. PC.18 Describe logic rules. PC.19 Explain digital logic system. PC.20 Draw basic logic symbols.	100	-	-	-

NOS/Module: **MSME/CCPCBF/02** Designing of PCB using CAD/CAM software	PC.1 State rules and regulations of PCB design. PC.2 Place the components. PC.3 Minimize the size of PCB. PC.4 Convert schematic diagram to layout diagram. PC.5 Place ground lines and power supply. PC.6 Maintain the mounting holes. PC.7 Maintain the angular ring. PC.8 Maintain the air gaps. PC.9 Maintain the track width. PC.10 Do tracking PC.11 Generate drilling drawing. PC.12 Generate mechanical drawings. PC.13 Explain CAD fundamentals. PC.14 Draw schematic diagram. PC.15 Place schematic components. PC.16 Edit a library path. PC.17 Do wiring. PC.18 Generate netlist. PC.19 Placement of component for layout designing. PC.20 Library editing in layout. PC.21 NC Drill file generation. PC.22 Gerber file generation. PC.23 Convert Design file to Gerber file and vice versa. PC.24 How to take printout.	-	100	-	-

NOS/Module: **MSME/CCPCBF/03** Prepare for Image Transfer Technique	PC.1 Define the artworks required to manufacture a PCB. PC.2 Read mechanical and drilling drawing. PC.3 Name the types of laminates. PC.4 Find out the thickness of laminates. PC.5 Properties of glass epoxy laminates. PC.6 Properties of Teflon. PC.7 Properties of Aluminum based laminates. PC.8 Properties of double sided laminates. PC.9 Characteristics of Lith film. PC.10 Characteristics and developing of five star films. PC.11 Characteristics and developing of Chromoline film. PC.12 Characteristics of Photo Polymer Dry Film Resist. PC.13 Process for developing and fixing of lith films. PC.14 Process for making negative and positive films. PC.15 Process of retouching of lith films. PC.16 Observe precautions to protect the Photo Polymer Dry Film Resist. PC.17 Carry out process of single side lamination. PC.18 Carry out process of double side lamination. PC.19 Carry out process of exposing. PC.20 Carry out process of developing of dry film. PC.21 Fabricate screen. PC.22 Select fabrics. PC.23 Measure tension of screen. PC.24 Prepare stencils. PC.25 Use squeeze. PC.26 Use ink. PC.27 Carry out after printing process for drying.	-	100	-	-

	PC.28 Understand PCB waste management. PC.29 Recycle and recovery technique. PC.30 Minimize wastages.				
NOS/Module: **MSME/CCPCBF/04** Perform Mechanical & Chemical Operation to Manufacture PCB	PC.1 Plan sheet cutting. PC.2 Cut sheets by using shearing machine. PC.3 Make mounting holes/slots by using punching machine. PC.4 Final cutting by using angular cutting machine. PC.5 Drill manually using drilling machine. PC.6 CNC programming. PC.7 CNC drilling. PC.8 CNC routing. PC.9 Knows the materials used in HAL machine. PC.10 Understand how to flux before tinning. PC.11 Understand how to tin on single as well as double side PCB. PC.12 Remove the oxidation layer from copper surface by manual cleaning, chemical process. PC.13 Remove the oxidation layer from copper surface by chemical process. PC.14 Remove unwanted copper by using etching process. PC.15 Spray etching. PC.16 Splash etching. PC.17 Bubble etching. PC.18 Tank etching. PC.19 Inspect the PCB with the help of BBT technique. PC.20 Inspect open circuit and short circuit. PC.21 Inspect for over etched/under etched. PC.22 Inspect hole size.	-	100	-	-

	PC.23 Inspect hole for conformity with pad. PC.24 Inspect for missing/extra hole. PC.25 Inspect overall PCB.				
NOS/Module: **MSME/ES/01** Employability Skills	PC.1 Discuss the importance of Employability Skills in meeting the job requirements. PC.2 Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen. PC.3 Show how to practice different environmentally sustainable practices. PC.4 Discuss 21st century skills. PC.5 Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations. PC.6 Use appropriate basic English sentences/phrases while speaking. PC.7 Demonstrate how to communicate in a well -mannered way with others. PC.8 Demonstrate working with others in a team. PC.9 Show how to conduct oneself appropriately with all genders and PwD PC.10 Discuss the significance of reporting sexual harassment issues in time PC.11 Discuss the significance of using financial products and services safely and securely. PC.12 Explain the importance of managing expenses, income, and savings. PC.13 Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws. PC.14 Show how to operate digital devices and use the associated applications and features, safely and securely.	100	-	-	-

	PC.15 Discuss the significance of using internet for browsing, accessing social media platforms, safely and Securely. PC.16 Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges. PC.17 Differentiate between types of customers. PC.18 Explain the significance of identifying customer needs and addressing them. PC.19 Discuss the significance of maintaining hygiene and dressing appropriately. PC.20 Create a biodata PC.21 Use various sources to search and apply for jobs PC.22 Discuss the significance of dressing up neatly and maintaining hygiene for an interview PC.23 Discuss how to search and register for apprenticeship opportunities				
	Total Marks	**200**	**300**	**-**	**-**

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
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.
Short Term Training (STT)	STT/ Short -term skilling means any vocational training program undertaken for less than a year (Theory + Practical + OJT). https://ncvet.gov.in/sites/default/files/NCVET.pdf