



QUALIFICATION FILE

Mechanical Assembler

- ☐ 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: 3.5

Submitted By:

NETTUR TECHNICAL TRAINING FOUNDATION
23/24, II PHASE, PEENYA INDUSTRIAL AREA,
BENGALURU – 560058, KARNATAKA

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Section 1: Basic Details

1.	Qualification Name	Mechanical Assembler								
2.	Sector/s	Capital Goods and Manufacturing								
3.	Type of Qualification: ☒ New ☐ Revised ☐ Has Electives/Options ☐ OEM	NQR Code & version of existing/previous qualification: (change to previous, once approved)		Qualification Name of existing/previous version: Mechanical Assembler						
4.	a. OEM Name b. Qualification Name (Wherever applicable)	NA								
5.	National Qualification Register (NQR) Code & Version (Will be issued after NSQC approval)	QG-3.5-CG-01035-2023-V1-NTTF	6. NCrF/NSQF Level: 3.5							
7.	Award (Certificate/Diploma/Advance Diploma/ Any Other) (Wherever applicable specify multiple entry/exits also & provide details in annexure)	Certificate								
8.	Brief Description of the Qualification	The Candidate will be able to do Fitting and Assembling Mechanical Components. The subjects covered in this Programme are - Employability Skills, English Communication, Engineering Mathematics, Engineering Science, Manufacturing Technology-I & II, Metrology, Engineering Graphics -I & II, Material Technology, Modern Shop Floor Practice, Painting Technology(Elective-Auto), Cutting Tools(Elective-Manufacturing), Categories of Jewellery(Elective-Jewellery), Basic Mechanical Workshop, Observation/Practice on painting (Elective-Auto), Mechanical Lab - Auto(Elective-Auto), CAD Lab - Auto(Elective-Auto), Mechanical Lab - Mfg(Elective-Manufacturing), CAD Lab - Mfg(Elective-Manufacturing), Mechanical Work shop II(Elective-Jewellery), OJT								
9.	Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	Entry Qualification & Relevant Experience: <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Academic/Skill Qualification (With Specialization - if applicable)</th> <th>Required Experience (with Specialization)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Minimum 10th Pass</td> <td>NA</td> </tr> </tbody> </table>			Sl. No.	Academic/Skill Qualification (With Specialization - if applicable)	Required Experience (with Specialization)	1	Minimum 10 th Pass	NA
Sl. No.	Academic/Skill Qualification (With Specialization - if applicable)	Required Experience (with Specialization)								
1	Minimum 10 th Pass	NA								
10.	Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))	Total Credits – 44		11. Common Cost Norm Category (I/II/III) (wherever applicable): NA						
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																							
		<table border="1"> <thead> <tr> <th>Training Delivery Modes</th> <th>Theory (Hours)</th> <th>Practical (Hours)</th> <th>OJT / Project Mandatory (Hours)</th> <th>OJT Recommended (Hours)</th> <th>Total (Hours)</th> </tr> </thead> <tbody> <tr> <td>Classroom (offline)</td> <td>270</td> <td>240</td> <td>720</td> <td>-</td> <td>1230</td> </tr> <tr> <td>Online</td> <td>90</td> <td></td> <td></td> <td></td> <td>90</td> </tr> </tbody> </table>						Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT / Project Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)	Classroom (offline)	270	240	720	-	1230	Online	90				90
		Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT / Project Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)																		
		Classroom (offline)	270	240	720	-	1230																		
Online	90				90																				
(Refer Blended Learning Annexure for details)																									
14.	Aligned to NCO/ISCO Code/s (if no code is available mention the same)	NCO code : 2015.8211.0100, 2015.8211.1200, 2015.8211.1300																							
15.	Progression path after attaining the qualification. (Please show Professional and Academic progression)	Professional Progression: After Completion of 1 year of Full Time Programme can work as integrating and assembling of machine parts, maintain & service the equipment. After Completion of 3 years of Full Time Programme and after 5 years of Industry Experience the Job Holder can work as Maintenance Engineer, Customer service Academic Progression: Advanced Certificate - Assistant Technician - Manufacturing and Assembly																							
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: NA																							
18.	Is the Job Role Amenable to Persons with Disability	☐ Yes ☒ No If "Yes", specify applicable type of Disability:																							
19.	How Participation of Women will be Encouraged	Yes - Admission open to women candidates (10% seats are reserved)																							
20.	Are Greening/ Environment Sustainability Aspects Covered (Specify the NOS/Module which covers it)	☐ 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 (In case of CS or MS, provide details of both Lead AB & Supporting ABs)	Name: Mr. R Rajagopalan Position in the Organization: Joint Managing Director Email: rg@nttf.co.in Tel. number: 080 – 28390215 Contact Number: 9844013448 Website: nttfrg.com																							
23.	Final Approval Date by NSQC: 29 Sep 2023	24. Validity Duration: 3 years		25. Next Review Date: 29 Sep 2026																					

Section 2: Module Summary

NOS/s of Qualifications (In exceptional cases these could be described as components)

Mandatory Module / 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

Sl. 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)
SEMESTER – I																
1	English Communication	CP33101T	Core	3.5	22	25	-	-	-	25	75	-	-	25	100	
2	Engineering Mathematics	CP33102T	Core	3.5		30	-	-	-	30	100	-	-	-	100	
3	Engineering Science	CP33103T	Core	3.5		40	-	-	-	40	100	-	-	-	100	
4	Manufacturing Technology-I	CP33104T	Core	3.5		30	-	-	-	30	100	-	-	-	100	
5	Metrology	CP33105T	Core	3.5		25	-	-	-	25	100	-	-	-	100	
6	Engineering Graphics -I	CP33106P	Core	3.5		-	40	-	-	40	-	75	-	25	100	
7	Basic Mechanical Workshop	CP33107P	Core	3.5		-	80	-	-	80	-	75	-	25	100	
8	OJT	CP33108P	Core	3.5		-	-	360	-	360	-	75	-	25	100	
9	Employability Skills	CP33109T	Core	3.5		30	-	-	-	30	75	-	-	25	100	
Duration (in Hours)/ Total Marks					22	180	120	360	-	660	550	225	-	125	900	
SEMESTER – II																
10	Manufacturing Technology – II	CP33201T	Core	3.5	22	40	-	-	-	40	100	-	-	-	100	
11	Material Technology	CP33202T	Core	3.5		40	-	-	-	40	100	-	-	-	100	
12	Engineering Graphics – II	CP33203P	Core	3.5		-	75	-	-	75	-	75	-	25	100	
13	Modern Shop Floor Practice	CP33204T	Core	3.5		40	-	-	-	40	100	-	-	-	100	
14	Elective Theory 1/2/3 (Choose One)	CP332XX*T	Core	3.5		30	-	-	-	30	100	-	-	-	100	
15	Elective Practical 4/5/6 (Choose One)	CP332XX*P	Core	3.5		-	45	-	-	45	-	75	-	25	100	
16	OJT	CP33218P	Core	3.5		-	-	360	-	360	-	75	-	25	100	
17	Employability Skills	CP33219T	Core	3.5		30	-	-	-	30	75	-	-	25	100	
Duration (in Hours)/ Total Marks						22	180	120	360	-	660	475	225	-	100	800
Total for 1-year Programme					44	360	240	720	-	1320	1025	450	-	225	1700	

Elective Modules/ NOS/s:

Sl. 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
SEMESTER – II																
1	Painting technology	CP33205T	Core	3.5		30	-	-	-	30	100	-	-	-	100	
2	Cutting Tools	CP33206T	Core	3.5		30	-	-	-	30	100	-	-	-	100	
3	Categories of Jewellery	CP33207T	Core	3.5		30		-	-	30	100	-	-	-	100	
4	4.1 Observation/Practice on painting	CP33208P	Core	3.5		-	15	-	-	15	-	75	-	25	100	
	4.2 Mechanical Lab - Auto	CP33209P	Core	3.5		-	15	-	-	15	-	75	-	25	100	
	4.3 CAD Lab - Auto	CP33210P	Core	3.5		-	15	-	-	15	-	75	-	25	100	
5	5.1 Mechanical Lab - Mfg	CP33211P	Core	3.5		-	30	-	-	30	-	75	-	25	100	
	5.2 CAD Lab - Mfg	CP33212P	Core	3.5		-	15	-	-	15	-	75	-	25	100	
6	6.1 Mechanical workshop II	CP33213P	Core	3.5		-	45	-	-	45	-	75	-	25	100	

Optional Modules/ NOS/s: NA

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

Assessment - Minimum Qualifying Percentage

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

To pass the Qualification, every trainee should score a minimum of 40% in each Theory and 50% in each Practical and 60% in OJT / Projects.

Section 3: Training Related

1.	Trainer's Qualification and experience in the relevant sector (in years) <i>(as per NCVET guidelines)</i>	Diploma in relevant field with 3 years as trainer or industry experience B. Tech or BE with 2 years of trainer or industry experience
2.	Master Trainer's Qualification and experience in the relevant sector (in years) <i>(as per NCVET guidelines)</i>	Diploma in relevant field with 5 years as trainer or industry experience B. Tech or BE with 5 years of trainer + industry experience
3.	Tools and Equipment Required for Training	☒ Yes ☐ No (If "Yes", details to be provided in Annexure)
4.	In Case of Revised Qualification, Details of Any Upskilling Required for Trainer	NA

Section 4: Assessment Related

1.	Assessor's Qualification and experience in relevant sector (in years) <i>(as per NCVET guidelines)</i>	Diploma with 4 years as trainer or industry experience B. Tech or BE with 3 years as trainer or industry experience
2.	Proctor's Qualification and experience in relevant sector (in years) <i>(as per NCVET guidelines)</i>	Diploma or B. Tech or BE with 2 years of experience
3.	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) <i>(as per NCVET guidelines)</i>	Diploma with 4 years as trainer or industry experience B. Tech or BE with 3 years as trainer or industry experience
4.	Assessment Mode <i>(Specify the assessment mode)</i>	Theory and practical (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.	Research Reports: The following reports establish the Skilled Resource requirement for the Manufacturing, Capital Goods and Automotive Industries. a. MSDE Annual Report 2021- 2022 predicts very high growth on Manufacturing Sector. b. MSDE/ NSDC Human Resources and Skill Requirements in the Auto and Auto Components Sector report (2013- 2017 2017 – 2022) The Report Forecast a Higher growth in Automotive Manufacturing, Automotive Components Manufacture Sector c. Human Resources and Skill Requirements in the Capital Goods Sector report (2012 – 2017 2017 – 2022) The Report Envisages Higher Growth in Capital Goods Sector d. Annual reports 2021 – 22 of Ministry of Heavy Industries Government of India The above Studies has found Higher growth in Manufacturing, Capital Goods and Automotive Industries
2.	Latest Market Research Reports or any other source (not older than 2 years) (Yes/No): The following reports establish the Skilled Resource requirement for the Manufacturing, Capital Goods and Automotive Industries. a. Indian Skills Report 2021-22 by Wheebox - partnered CII predicts skill requirement in Engineering and Manufacturing sectors. b. NASSCOM, FICCI and EY report on Future of Jobs in India – 2022 - Perspective predicts higher growth in Component Manufacturing and Automotive sector.
3.	Government /Industry initiatives/ requirement (Yes/No): YES a. Study on Job Role of the Future by Indian Institute of Skills. b. The Study has found High Demand in Manufacturing Sector for Persons with Skills/Knowledge on Emerging Technologies.
4.	Number of Industry validation provided: 92
5.	Estimated nos. of persons to be trained and employed: 4000 / year
6.	Evidence of Concurrence/Consultation with Line Ministry/State Departments: (Letter to be sent to the concerned ministry and copy attached) If “No”, why: Under Process

Section 6: Annexure & Supporting Documents Check List*Specify Annexure Name / Supporting document file name*

1.	Annexure 1: NCrf/NSQF level justification based on NCrf level/NSQF descriptors (Mandatory)	Yes
2.	Annexure 2: List of tools and equipment relevant for qualification (Mandatory, except in case of online course)	Yes
3.	Annexure 3: Industry Validations Summary	Yes
4.	Annexure 4: Training & Employment Details	Yes
5.	Annexure 5: Blended Learning (Mandatory, in case selected Mode of delivery is “Blended Learning”)	Yes
6.	Annexure 6: Detailed Assessment Criteria (Mandatory)	Yes
7.	Annexure 7: Assessment Strategy (Mandatory)	Yes
8.	Annexure13: Multiple Entry-Exit Details (Mandatory, in case qualification has multiple Entry-Exit)	No
9.	Annexure: Acronym and Glossary (Optional)	Yes
10.	Supporting Document: Model Curriculum (Mandatory – Public view)	Digital content available to trainees through Edusquares ERP (Will be made public after the qualification is approved) (Annexure 8)
11.	Supporting Document: Career Progression (Mandatory - Public view)	Yes (Annexure 9)
12.	Supporting Document: Occupational Map (Mandatory)	Yes (Annexure 11)
13.	Supporting Document: Assessment SOP (Mandatory)	Yes (Annexure 10)
14.	Supporting Document: Key Learning Outcome	Yes (Annexure 12)
15.	Any other document you wish to submit:	No

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	• Practice Basic Engineering Mathematics. • Describe the importance of Health and Safety. • Explain the operations of various conventional machines. • Explain the importance of Metrology in industry. Identify the measuring instruments and application. • Explain the need of Engineering drawing and creation of drawing using CAD software. • Describe the properties of Engineering materials and use. • Explain classification, selection, and use of hand tools. • Describe manual metal working processes used in Manufacturing, Automobile and precision metal industries. • Explain the different categories of Jewellaries. • Explain practices used in modern shop floor.	• Application of basic mathematical concepts for calculations of speed, feed, depth of cut machining, and in engineering drawing. • Demonstrate Safety and Health aspects and Ensures Compliance with Health and Safety Regulations. • Demonstrate different manufacturing processes, selection of machines and tools. • Demonstrate principles of measurement, operation of measuring instruments, selection and use. Limits and Fits and tolerances. • Application of drawing standards, types of projections, drafting, dimensioning, drawing interpretation. • Application of ferrous, non-ferrous metals, alloys, polymers, Precision metals, composites and ceramics. • Demonstrate manual working methods and equipment. Identify processes to be performed from the drawings. • Identify the types of jewellery. • Demonstrate shop floor practices like QC, 5S and KAIZEN.	3.5
Professional and Technical Skills/ Expertise/ Professional Knowledge	• Execute Different manual metal working Processes. • Execute conventional machining. • Explain Measuring/Inspection Equipment used in manufacturing. • Demonstrate Professional Knowledge on Manufacturing Procedure of machined parts. • Demonstrate professional knowledge on interpretation of engineering drawings and preparation of production drawings. • Exhibit and maintain a safe working environment and good housekeeping practices.	• Perform different manual metal working methods on the assigned job to achieve defined specification, dimensions and fits. Do precision fitting operations. • Perform on Conventional machines, following standard procedures. Select appropriate machines and tools. • Perform types of measurements using appropriate measuring devices. Use measuring instruments, gauges, sine bar, and profile projectors for precision measurements. • Perform CAD application 2d and 3d using CAD software. • Manufacture, Inspect and assembly of machined parts. • Follow safe working practices to prevent accidents.	3.5

Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	• Communicate Effectively with Peers and Supervisors in the work area. • Describe Knowledge of Organization, ethical & moral values, and Practice Time Management, shop floor practices. • Work Effectively in a Team. • Proficiency in Manual metal working Processes. • Using CAD Software. • Proficiency in using Conventional Machine. • Proficiency in Use of Measuring/Inspection Equipment • Machining of Parts Using Manual, Conventional machines.	• Good Communication with Peers, superiors both verbal and written, Good on Presentation Skills, • Demonstrate shop floor practices like QC, 5S, Kaizen. • Follow the instructions to work effectively. • Create engineering drawings using CAD software. • Perform Manual metal working Operations to achieve required precision. • Prepare process plan and Machine the Components using Conventional machines and check quality.	3.5
Broad Learning Outcomes/Core Skill	• Proficiency in manual metal working processes and conventional machining. • Knowledge of CAD software for preparing technical drawing. • Can do calculations required for Manufacturing and Inspection • Prepare Technical Reports and Presentations using MS Office • Describe Safety and standard operating Procedures and Practices in the work area. • Communicate with Peers and Superiors. • Describe effective 5S.	• Produce the parts using manual metal working and conventional machining as per the requirement. • Interpret and create simple Technical Drawings. • Calculate required details for Manufacturing and Inspection. • Make technical reports and Presentation using MS Office. • Follow all safety norms and standard operating Procedures in the work area. • Maintain Good Relationship with Peers and Superiors.	3.5
Responsibility	• Be aware of Personal/Industrial goals. • Adapt to changes in the work area. • Describe safety Procedures and SOPs in the relevant work area.	• Carry out machining of parts using conventional machines under Minimum Supervision. • Perform manual machining operations to achieve required dimensions and fits. • Follow the standard procedures in Fulfilling tasks Assigned to them. • Follow all safety norms and standard operating Procedures in the work area.	3.5

Annexure 2: Tools and Equipment (Lab Set-Up)**List of Tools and Equipment for a batch of 30 trainees**

SL. NO.	NAME OF THE TOOL AND EQUIPMENT	SPECIFICATION	QUANTITY
1	Work Bench with Lockers - 4 vices / Bench		5
2	Bench Vice	125 mm	10
3	Set of Files		10
4	Steel Rule	150mm	10
5	Steel Rule	300mm	5
6	Vernier caliper	0.02 least count	10
7	Scriber		10
8	Centre Punch	60° & 90°	10
9	Try Square	100 mm x 75 mm	10
10	Hack Saw with Blade	300 mm	10
11	Hammer	200g and 500g	5
12	Cast Iron Surface Plate	600mm X 450mm with Stand	1
13	Angle Plate	250mm X 150mm X 175mm	1
14	V - Blocks	150mm X 100mm X 60mm	1
15	Vernier Height Gauge	600mm	1
16	V block	80mm sq 1 pair	1
17	Ring Spanners set	6 mm to 22 mm	1
18	Double Ended Spanner Set	6 mm to 22 mm	1
19	Adjustable Spanners	70/ 30	1
20	Philips Screw Driver set		1
21	Flat Screw Drivers Set		1

22	Circlip Pliers – Set		1
23	Torque Wrench Ratchet type	70 to 340 Nm	2
24	Pneumatic Screw Driver		2
25	Pneumatic Nut Runner		2
26	Allen Key Set (mm sizes)		1
27	Bearing puller	100 mm	1
28	Drill Machine Portable	ø6mm	1
29	Portable Angle Grinder	100mm	1
30	Socket set - 24 pieces	10 to 32	1
31	200A Inverter based Arc Welding Machine with all Accessories		1
32	MIG Welding Machine 400A with all Accessories		1
33	Electrode drying Oven	Capacity: 25kg	1
34	Welding Table with Fixture		2
35	Centre Lathe	Machining Dia: 100mm x 650mm long	1
36	Vertical Milling Machine	Machining size: 250mm x150mm x100mm H	1
37	Surface Grinding Machine	Machining size: 450mm x150mm x100mm H	1
38	Bench Drilling Machine	Maximum Dia. On steel – Ø10m	1
39	Bench Grinder	Wheel Dia: 200mm x 20mm thick - 2 sided	1
40	Power hacksaw	350 mm	1
41	CNC Lathe machine with Accessories and Servo Stabiliser		1
42	CNC Milling machine with Accessories and Servo Stabiliser		1

43	CNC Simulation Software - 10 user license.		1
44	Compressor	Compressor- Reciprocating Air Compressor - 2 stage/2 Cylinder with 3 phase motor capacity 8CFM, Air Receiver Size- 160l	1
45	Pneumatic Trainer Kit		1
46	Hydraulic Trainer Kit		1
47	PLC Trainer Kit		1
48	Sensor Trainer Kit with Assorted Sensors		1
49	Pneumatic Simulation Software -10 User		1
50	Hydraulic Simulation Software - 10 User		1
51	PLC Simulation Software - 10 User		1
52	Robot Simulation Software -10 User		1
53	Automobile Drive Train		1
54	Computer		10
Equipment / Machineries available where OJT is being conducted			

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. Black / White board
2. Projector with screen / Display TV
3. Laptop / Computer

Annexure 3: Industry Validations Summary

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

Sl. No.	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile
1	M/s. ACE Designers Limited	Mr. Veeresha K K		Plot No. 7 & 8, 80 Feet Rd, II Phase, Peenya, Bengaluru, Karnataka 560058	+91 9611622522	veeresha_kk@acedesigners.co.in	
2	M/s. Alpha Elsec Defence and Aerospace Systems Pvt Ltd	Mr. Lalithkumar M		4th Cross Rd, Peenya 1st Stage, Peenya, Bengaluru, Karnataka 560058	+91 8618115045	lalithkumar.m@alpha-elsec.com	
3	M/s. Ace Multi Axes Systems Limited	Mr. RL Patil		No. 17, Plot No. 467-9, Peenya Industrial Area Phase IV, Peenya Industrial, Area, Bengaluru, Karnataka 560058	+91 9945503052	patil@acemulti.net	
4	M/s. Auto CNC Machining Private Limited	Ms. Rohini		4th Phase, 282, 4th Main, Near, Tvs Cross, Peenya, Bengaluru, Karnataka 560058	+91 9591305181	hr@autocnc.co.in	
5	M/s. Acwa Automatics LLP	Mr. Madhu		No, 204, 12th Main Rd, 3rd Stage, Peenya, Bengaluru, Karnataka 560058	+91 9844007796	madhu@acwaautomatics.com	
6	M/s. sartorius stedim india private limited	Mr. Sudheer		No.-69/2 & 69/3, Jakkasandra, Kunigal Road, Nelamangala Taluk, Bangalore - 562123	+91 9845287865	sudheer.adithya@sartorius.com	
7	M/s. Sphoorti Machine Tools Pvt. Ltd.	Mr. Nandakumar		Plot No. 467, #18, 469, 12th Cross Rd, Peenya Industrial Area Phase IV, Peenya, Bengaluru, Karnataka 560058	+91 80 41272768	hr@spoorthi.com	
8	M/s. DC Auto Parts Private Limited	Mr. Santosh		No. A-267, 6th Main, 2nd Stage, Peenya Industrial Estate, Bengaluru-560058	+91 80 28364423	-	
9	M/s. COMPRESSOR CARE	Mr. SANJEEV KUMAR		68, Shakti Vihar Rd, Awass Vikas, Rudrapur, Uttarakhand 263153	+91 9917328888	info@compressorcare.co.in	
10	M/s. KRISTEEL SHINWA INDUSTRIES SILVASSA	MR. JALAPUR		47 Govt industrial estate, Masat, Silvassa, 396230	+91 9558876587	mbjalapur@kristeel.com	

11	M/s. GATE INDIA PRIVATE LIMITED PUNE	MR SAHIL KOLHE		Plot No. K-8, Near Hyundai Company-Khalumbre, Pune, Maharashtra 410501	+91 9975564970	sahil.kohle@teamlease.com	
12	M/s. HOLISTER MEDICAL INDIA PRIVATE LIMITED	MS. SARIKA		Plot No. 27, Sector 5 Phase II, HSIIDC Growth Center, Bawal, Haryana 123501	+91 9050750090	panacea.anilsandilya@gmail.com	
13	M/s. ABI Showatech India Pvt Ltd	Mr. S. Ganesan		Pulivalam Village & Post Via Banavaram, Vellore Dist 632505, Tamil Nadu, India.	9790977674	Ganesan.SR@abishowatech.co.in	
14	M/s. Amara Raja batteries Ltd	Mr. P Lakshmi Narayana		Karakambadi Rd, Mangalam, Tirupati, Andhra Pradesh 517507		pln@amararaja.co.in	
15	M/s. Bellsonica Auto Components India Pvt Ltd	Mr. Dharmendra		Plot No. 1, Phase3A, Sector 8, Imt Manesar, Gurugram, Haryana 122051	9810722584	dharmender.kumar@bellsonicaindia.com	
16	M/s. Brakes India (Foundry Division)	Mr. Senthilnathan		New No.5, 4th Main Road, Gandhi Nagar, Adyar, Chennai – 600 020	7867041722	fdypersonnel@brakesindia.co.in	
17	M/s. Brakes India Private Limited	Mr. Arun kumar		Plot No 55, , Block C, Menakuru Village, Naidupeta, Andhra Pradesh - 524421	7094440721	Arunkumar.S@brakesindia.co.in	
18	M/s. Caterpillar India private limited	Mr. Devendran Thiruganasambandam		Melnallathur Post, Thiruvallur, Tamil Nadu 602004	9940435287	thiruganasambandam_devendran@cat.com	
19	M/s. Fritzmeier Motherson Cabin Engg Ltd	Mr.Sivakumar		Post 631561, NH4 - Athivakkam Road/112 - Singadivakkam/Attuputhur, Kanchipuram, Tamil Nadu 631561	8056000347		
20	M/s. Hitachi Astemo Chennai Private Limited	Ms.G.Preetha		Plot No:17, One Hub Chennai,Panchanthiruthi Village, Manamathy PO, Thiruporur Tk, Kanchipuram District,Pincode – 603 105	8428206671	preetha.ganesan.fo@hitachiastemo.com	
21	M/s. India Pistons Limited	Mr. Ramesh		Huzur Gardens, Sembiam, Chennai - 600011	7904524074	ird.sembiam@indiapistons.com	

22	M/s. PRECISION MACHINE & AUTO COMPONENTS PVT LTD	Mr.Udhayakumar S		B70/2,Sipcot industrial Park, Irrungattukottai,Sriperumbudur - 602105	9841688468	udhaya@pmacindia.com	
23	M/s. Real Talent Engineering Private Limited	Mr. Duraisamy		SIDCO Estate, RK Pet, Near Police Station, Rk Pet, Vellore-631304, Tamil Nadu	9843051234	doraiswamy.s@rte.org.in	
24	M/s. Saint-Gobain India Pvt. Ltd	Mr. Pugalenth		Plot No-36, GIDC Mega Estate, Jhagadia, Jhagadia, Bharuch, Gujarat - 393110	9994069222	pugalenth.m@saint-gobain.com	
25	M/s. Saint-Gobain India Pvt. Ltd ,Bhiwadi	Mr. Shivasakar		Plot No. SP1, Kaharani, Bhiwadi Extension, RIICO Industrial Area, Bhiwadi, Rajasthan 301019	8003194214	shivsagar.sharma@saint-gobain.com	
26	M/s. Saint-Gobain India Pvt. Ltd,Chennai	Mr. Pugalenth		Plot NO. A-1 Sipcot Industrial Park, Mambakkam, Sriperumbudur, Tamil Nadu 602105	9994069222	pugalenth.m@saint-gobain.com	
27	M/s. Samsung India Electronics Pvt Ltd	Mr. Ramesh		SH 120, Sriperumbudur, Kanchipuram, Tamil Nadu 602106	9994393455	shikha.s11@samsung.com	
28	M/s. THE ACETECH MACHINERY COMPONENTS INDIA PVT LTD	Ms.Narmadha T		Acetech Heavyfab Private Limited,S.F 62/2C, Padurmedu, Poonamallee, Chennai - 602 107.	7358736726	planthr2@acetechindia.in	
29	M/s. Tube Product of India	Mr.Deepak		Post Box No. 18, Mth Road, Avadi, Chennai, Tamil Nadu 600054	9840996496	DeepakAPJ@tii.murugappa.com	
30	M/s. Turbo Energy Private Limited	Mr. Baranidharan		Turbo Energy Private Limited, Pulivalam, Banavaram, Vellore, Tamil Nadu, 632505	9787714955	baranidharan.tv@turboenergy.co.in	
31	M/s. Turbo Energy Pvt Ltd	Mr. Baranidharan		Survey Block No. 859, Por Industrial Park Village, Vadodara, Gujarat, 391243	9787714955	baranidharan.tv@turboenergy.co.in	
32	M/s. Turbo Energy Pvt Ltd, Payanoor	Mr. Baranidharan		100, Old Mahabalipuram Road, Paiyanur, Kanchipuram, Tamil Nadu, 603104	9787714955	baranidharan.tv@turboenergy.co.in	
33	M/s. Wheels India Limited	Mr.Jayanth		453V+Q8W, Madras Thiruvallur High Rd, TVS Industries, Padi, Chennai, Tamil Nadu 600040	9841003176	jayanth_t@wheelsindia.com	

34	M/s. Wipro Infrastructure Engineering	Mr. Balamurali		Sipcot Industrial Park, Irungattukottai, Sriperumbudur, C 1, Mevalurkuppam, Tamil Nadu 602105	9940535558	balamurali.n96@wipro.com	
35	M/s. Indo-mim Pvt Ltd	Mr. Vishal Argekar		#45[p], KIADB Industrial Area, Doddaballapur, Bangalore 561 203	7892754941	vishal.a@indo-mim.com	
36	M/s. Spacenex Aero Private Limited	Mr. Tippleswamy		# 13, Hi-tech Aerospace & Defence Park, KIADB Industrial Area, Bhatramarenahalli Devanahalli (taluk), Bangalore - 562110, Karnataka, India	8073161212	thippeswamy.s@spacenex.com	
37	M/s. Krupa Technologies	Mr. Shambulingana Gowda		#5, 5th Cross, 8th Main, Slv Industrial Area, Peenya, Bangalore - 560058	--	shambu@krupatechnologies.in	
38	M/s. Ajax Engineering Pvt Ltd	Mr. Abhishek		Plot Nos: 3, 16 & 17, KIADB Industrial Area, Bashettyhally Doddaballapur Taluk, Bengaluru Rural, karnataka - 561203.	9606921030	abhishek.r@ajax-engg.com	
39	M/s. Wadpack Pvt Ltd	Mr. Gopal		Sw-20, 2nd Phase, Apparel Park, KIADB Industrial Area, Doddaballapura, Karnataka 561203	9945245419	gopal@wadpack.co.in	
40	M/s. Mach Aero Pvt Ltd	Mrs. Chaithra		Plot No. 27-b Doddaballapura Industrial Area 98-99 Veerapura Village, Kassba-hobli Bangalore 561203, India	8027630565	chaithra@machaero.co.in	
41	M/s. YG Cutting Tools	Mr. Vishwanath Shetty		Plot No 2c- Obadenahalli Industrial Area Doddaballapura 3rd Phase, National Highway 207, Nagandenahalli, Karnataka 561205	--	vishwanath.shetty@yg1india.com	
42	M/s. Omni Matrix Pvt. Ltd	Mr. Manjunath		Plot No.48k1 & 48k2, KIADB Industrial Area, Yellupura, Doddaballapura Indl. Area, Bengaluru-561203, Karnataka, India	8105886323	manjunath@omnimatrixindia.com	
43	M/s. Wipro Enterprises Pvt Limited	Mrs. Komala N		Plot no 21, Bengaluru aerospace SEZ Devanahalli, Bangalore north, 562129	9880224840	komala.n96@wipro.com	

44	M/s. Micromatic Grinding Technologies Ltd	Mrs. Urmila Balaram		5/a #74, 103, 106, 107 Kiadb Industrial Area, Dobaspet, nelamangala, Bangalore-562111	8027735383	urmilab@microtech.co.in	
45	M/s. Tractor And Farm Equipment Ltd	Mr. Abhijit Guharoy		Plot No. 1, KIADB Industrial Area, Doddaballapur, Bengaluru - 561 203.	9538895092	abhijitg@tafe.com	
46	M/s. Micro Plastics Private Limited	Mr. G. Anbarasan		Khatha No. 170/1, SY. No. 330/3, Subharam Industrial Estate, Marsur Gate, Anekal Road, Bengaluru-562106, Karnataka, India	8068979801	anbarasan@mplastindia.com	
47	M/s. Ankit Fasteners	Mr. indrajith		297,Haragadde village Road No 4, Jigani industrial Estate ,Banglore	8197691426		
48	M/s. Avasarala Technologies Limited	Mr. krishna		No.47, 36th Main Rd, Dollar Layout, 1st Stage, BTM 1st Stage, Bengaluru,	99006801529		
49	M/s. Guhring India Pvt. Ltd.	Ms. Roopa Rao		Plot No.129,Bommasandra Indl Area,Phase 4 Anekal Taluk 2638,Hosur rd,banglore	8497865140	rooparao@gururing.com	
50	M/s. Apex luminaries pvt ltd	Mr. Dharani Babu V		Apex luminaries pvt ltd plot #26C KIADB industrial Area malur kolara distic Karnataka-56310	9845480226	ddharani@apexgroups.in	
51	M/s. Sahara label	Ms. Shoba		#10 1st Cross, 1st main , Sri Lakshmi Industrial Estate, Thigalarapalya Main Rd, Karihobanahalli, Peenya 2nd Stage.	6366801529		
52	M/s. INDO MIM TEC PVT. LTD. DODDABALLAPUR	Mr. praveen		# 45(P) KIADB Industrial Area Doddaballapur, Bengaluru	9880697717		
53	M/s. TAEGUTEC INDIA LTD.	Ms. Vinodini A		Plot 119 & 120, Bommsandra, Koppa, Bommasandra Jigani Link Rd, Bommasandra Industrial Area, Bengaluru	9980596686	vinodini@taegutec-india.com	
54	M/s. Riddhi Machine Tools Ltd.	Ms. Suchitra		#471 sadguru tapovana royal park residency Alahalli, JP nagar 9th phase banglore	9945909155		
55	M/s. Middleby India Engineering Private Limited	Mr. Yogesh		No. 45, Jigani Rd, Bommasandra Industrial Area, Bengaluru, Karnataka 560099	7411690717		

56	M/s. Ashok Leyland Pvt. Ltd	Ms. Vidya Tiwari		Plot No.1 Sector 12, lie, Pantnagar, Uttarakhand 263153	+91 8941002580	vidya.tewari@ashokleyland.com	
57	M/s. Tata Motors Ltd	Mr. Tarak Chakraborty		Telco-Tata Motors , Jamshedpur-831004	7360022714	tarak.chakraborty@tataamotors.com	
58	M/s. Maruti Suzuki	Mr. Dinesh Kumar Nimesh		Nelson Mandela Road, Vasant Kunj, Delhi	8860199905	Dineshkumar.nimesh@maruti.co.in	
59	M/s. Tata Motors Randstand	Mr. Manish Tiwary		Bhadani Trade Centre,Bistupur, Jamshedpur-831001	8252707491	manish.tiwary@randstand.in	
60	M/S. Ashok Leyland Ltd	Mr. Aneesh		No.1, Sardar Patel Road, Guindy, Chennai – 600 032.	9985654949	Anees.SK@ashokleyland.com	
61	M/S. India Yamaha Motors Pvt Ltd	Mr. Sreenoop		VV1, Sipcot Industrial Park, Vallam Vadagal, Taluk, Sriperumbudur, Tamil Nadu 602105	7824833120	sreenoopkp@yamaha-motor-india.com	
62	M/S. Daimler India Commercial Vehicles Pvt Ltd	Mr. Kuldeep		SIPCOT Industrial Growth Centre, Oragadam, Mathur Post, Kundrathur Taluk, Kancheepuram District - 602105 Tamil Nadu, India	9940036730	kuldeep.g@daimler.com	
63	M/s. Brakes india pvt. Ltd.	Mr. Promod Kumar		Kolaibera, Seraikela Jharkhand-831016	8877160600	pramodkumar@brakesindia.co.in	
64	M/s. Mahalaxmi Enterprises	Mr. Amit Kumar		Telco-Tata Motors , Jamshedpur-831004	9122770810	office@mahalaxmienterprises	
65	M/s Welspun Corp	Ms. Harleen Kaur		Welspun city,village versamedj, tal. Anjar,district kutch	6357315540	harleen_kaur@welspun.com	
66	M/s. Ramakrishna Forgings	Mr. Subham Mishra		Industrial Area, Gamharia, Jamshedpur, Jharkhand 832109	8210551498	cnc-division@ramkrishnaforgings.com	
67	M/s. GS Auto International Ltd.	Mr. Subodh Kumar		Industrial Area, Gamharia, Jamshedpur, Jharkhand 832109	9234255995	hr@gsgroupindia.com	
68	M/s. Tata Steel Rural Development	Mr. Avinash Ekka		E-Road, Northern Town, Bistupur, Jamshedpur, Jharkhand	7903529560	avinash.ekka@tatasteel.foundation.org	
69	M/s. Kross Limited	Mr. R K Giri		Phase Vi, Adityapur Industrial Area, Jamshedpur - 832 108	9204859823	giri@krossindia.com	
70	M/s. Pebco Motors	Mr. Niranjana Kumar		Industrial Area, Adityapur, Jamshedpur-832109	9308433352	pebco.jam.srv1@marutidealers.com	

71	M/S Jamshedpur Utility Services Company Limited	Ms. Megna Gogna		Bistupur, Jamshedpur-831001	6576646000	corpcomm.jusco@tatasteel.com	
72	M/s. It Scient	Mr. Sumant Kumar		Autocluster, Adityapur	7903126248	hr.jsr@itscient.com	
73	M/s. IDFC	Mr. Ajit Singh		Bistupur, Jamshedpur-831001	7277544681	ajit.singh3@idfcfirstbank.com	
74	M/s. Tata Auto Comp.Pks	Mr. Suraj Kumar		Telco-Tata Motors , Jamshedpur-831004	7061032140	suraj6205339714@gmail.com	
75	M/s. Accrypoly	Mr. Ravi Shankar		M-10 ,Phase -Iv, Adityapur Industrial Area , Jamshedpur	0657 2387335	hr@accropolygroup.com	
76	M/s. JMT Auto Ltd.	Mr. Jaimant		7th Phase, Industrial Area, Adityapur, Jamshedpur-832109,	6576626331	jmt.auto@jmtauto.com	
77	M/s. RSB International	Mr. Manish Prakash		Ward NO.9, Gamharia, Jamshedpur - 832108	7677870351	manish.prakash@rsbglobal.com	
78	M/s. Reliance	Mr. Rajan Dey		Court House Lokmanya Tilak Marg, Mumbai	022-67673800	ranjan.dey@reliance.co.in	
79	M/s. Q Connect	Ms. Bharti Singh		Aegis Building, Dimna Chowk, Jamshedpur	9073303053	bharti.singh@qconnect.com	
80	M/s. Tata advance System Ltd.- Vendor Quess	Mr. G.Bala Subramanyam		Telco-Tata Motors , Jamshedpur-831004	9031080050	gonigunta.subramanyam@tataadvancedsystems.com	
81	M/s. Alchor	Ms. Laxmi Samanta Das		Bistupur, Jamshedpur-831001	9102982672	hr@alchorhotel.com	
82	M/s. M Pallonji & co.pvt	Mr. M Pallonji		Inside Tata Steel, Jamshedpur	6200295125	mpallonjitlj@gmail.com	
83	M/s. Trimurty & Sons	Mr. Trimurty		Inside Tata Steel, Jamshedpur	9204099688	trimurty_murty@yahoo.com	
84	M/s. PMS	Mr. Nihal Sharma		Inside Tata Steel, Jamshedpur	9065513121	hr.tsj@pmsindia.in	
85	M/s. SGB Scaffolding And Industrial Services Pvt Ltd	Mr. Gaddahar Das		Inside Tata Steel, Jamshedpur	9262792520	gdas@brandsafway.com	
86	M/s. Vaaman engg.	Mr. Biswajit Chateerjee		Inside Tata Steel, Jamshedpur	9939700904	vaamanjsr@gmail.com	
87	M/s. Nassuridin & Sons	Mr. Nassiruddin		Inside Tata Steel, Jamshedpur	9234459541	Nasiruddin.tsl@gmail.com	

88	M/s. Titan Company Limited, Jewellery Division, Hosur	Mr. Karthik raja		No 29 Sipcot Industrial Complex, Hosur Industrial Complex, Hosur	9940976333	karthikrajam@titan.co.in	
89	M/s. Vaibhav Global Limited Jaipur	Mr. Paneer Selvam		E-68, EPIP, Sitapura, Jaipur, Rajasthan 302022	+91 9358900563	paneer.selvam@vaibhavglobal.com	
90	M/s. ICON Enterprises Hosur	Dr. T. Hariprasad		304-A/5 3rd Floor, TNHB, Phase- VII, Brindhavan, Maruthi Nagar Rd, Hosur, Tamil Nadu 635109	+91 9994106619	iconenterpriseshr@gmail.com	
91	M/s. Zulu Design Studio	Mr. Nishanth		4/1, Kambar Street Krishna Nagar, Vellore Tamil Nadu- 632001	+91 9600888929	animationnishanth@gmail.com	
92	M/s. Devanshi Enterprises	Mr. Hitesh		First Floor Yes Bank Avas Vikas Rudrapur 263153	+91 9819211519	devanshienterprises06@gmail.com	

Annexure 4: Training & Employment Details

Training and Employment Projections: *Data to be provided year-wise for next 3 years*

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities
2023	2400	More than 10000	240	More than 1000	-	-
2024	2500	More than 10000	250	More than 1000	-	-
2025	2500	More than 10000	250	More than 1000	-	-

Training, Assessment, Certification, and Placement Data for previous versions of qualifications: (Previous years)

Qualification Version	Year	Total Candidates				Women				People with Disability			
		Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed
New Qualification	2017 - 2020	829	740	727	556	77	69	68	24	-	-	-	-
	2018 - 2021	1416	1264	1245	1175	154	136	135	59	-	-	-	-
	2019 - 2022	652	583	574	500	107	98	94	61	-	-	-	-

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: **NA**

Content availability for the qualifications:

☐ Participant Handbook ☐ Facilitator Guide ☒ Digital Content ☐ Qualification Handbook ☒ Any Other: In NTTF LMS and Edusquares ERP

Languages in which Content is available: English.

Annexure 5: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools: NOT APPLICABLE

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>

Sl. 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	Physical classroom, LMS, Web based, Online sessions	75:25
2	Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	Workshops, Mock sessions, Case study, Role play, Group Discussions, Sensitivity training, Transactional analysis.	95:05
3	Showing Practical Demonstrations to the learners	Using industry equipment and machinery, Workshop / Lab, Simulators	100:0
4	Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	Work on real time industry job, job rotation, job/process instructions, Workshop machines, Lab equipment, Simulators.	90:10
5	Tutorials/ Assignments/ Drill/ Practice	Class assignments, LMS assignments, Simulators	60:40
6	Proctored Monitoring/ Assessment/ Evaluation/ Examinations	Physical classroom, Labs, Workshop, Quiz tests, Project	100:0
7	On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	In the Industry	100:0

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
Semester -1					
English Communication	Reading and Listening comprehension	10			5
	Construction of Sentences	15			
	Dictionary learning - Learn a word a day, use of dictionary	10			5
	Synonyms and Antonyms	10			5
	Technical Report writing	20			
	Public Speaking Skills	10			10
	Total Marks	100			
Engineering Mathematics	Units, SI, MKS, FPS Units, Conversion of units	10			
	Mensuration – Calculation of Area and Volume	20			
	Percentage, Ratio and Proportion	10			
	Basics of Algebra	10			
	Trigonometry – Application	20			
	Graphs - Plotting graphs	15			
	Basic Statistics	15			
	Total Marks	100			
Engineering Science	Force, Motion and Energy	30			
	Stress and Strain Explanation, Related calculation	30			
	Corrosion and its Control	20			
	Magnetism Explanation, Laws Related to magnetism	20			

	Total Marks	100			
Manufacturing Technology-I	Safety – Work shop safety and Machine safety	5			
	Hand Tools - Types, Specification and Applications	15			
	Marking Tools - Types, Specification and Applications	10			
	Drilling – Drilling machine, drilling operation, Work Holding and Tool holding devices, RPM Calculation	15			
	Turning – Lathe turning operation, Work Holding and Tool holding devices, Related Calculation	30			
	Introduction to Measuring – Linear and Angular Measuring	10			
	Introduction to Welding – SMAW, MIG and TIG Welding	15			
	Total Marks	100			
Metrology	Introduction – Importance of inspection in an industry	05			
	Linear Measurement – Instruments used for Linear measurement	20			
	Angular Measurement - Instruments used for Angular measurement	15			
	Bore Measurement - Instruments used for Bore measurement	10			
	Gauges – Types of Gauges, Applications	10			
	Dial Indicator - Types, Specification and Applications	10			
	Slip Gauges - Grades, Applications in Precision measuring	10			
	Introduction to Limits and Fits – Related calculations	20			
	Total Marks	100			
Engineering Graphics - I	Engineering script – Standard for Alphabets and Numerical		5		
	Geometric Construction – Construction of Different shapes		5		
	Isometric views and Orthographic projection		15		5
	Sectional views		10		5

	Dimensioning and providing tolerances		15		10
	Screw Threads – Representation in Drawing		5		
	Understanding Shop floor Drawing / Instructions		20		5
	Total Marks	100			
Basic Mechanical Workshop	Usage of Steel Rule, Measuring Tape, Vernier Caliper, Micrometer, Bevel Protractor and Height Gauge		20		5
	Usage of Gauges - Go and No Go, Radius, Fillet and Feeler Gauges		15		5
	Usage of Hand Tools - Files, Spanner etc.		10		5
	Filing Practice, Precision Filing, Hacksawing Practice		10		5
	Drilling Practice		15		2.5
	Welding		5		2.5
	Total Marks		100		
OJT	On the Job Training in the relevant sector		75		25
	Total Marks		100		
Employability skills	Employability skills-Importance & applicability	15			5
	Behaviour skills	30			10
	Constitutional Values and Citizenship	30			10
	Total Marks	100			
Semester -2					
Manufacturing Technology - II	Turning – Lathe turning operation, Work Holding and Tool holding devices, Related Calculation	15			
	Milling – Types of milling machines, Types of cutters, milling operations, Work holding and Tool Holding devices, Related calculations	20			

	Grinding - Grinding operations, Work holding and tool holding devices, Specifications and Applications of grinding wheels. Related calculations	10			
	Casting – Process, Types, Applications	10			
	Forging – Process, Types, Applications	8			
	Extrusion – Process, Types, Applications	7			
	Press Tool Operations – Types of Press tools and Press tools operations	15			
	Rolling – Process, Types, Applications	5			
	Mechanical Surface Finishing Process – Process, Applications	10			
	Total Marks	100			
Material Technology	Properties of Material – Physical, Mechanical and Electrical	10			
	Ferrous Metals – Types, Properties and Applications	25			
	Non-Ferrous Metals and Alloys - Properties and Applications	20			
	Plastics - Types, Properties and Applications	20			
	Hard Materials – P M K N S H	10			
	Testing of Hardness – Types of hardness testing methods	15			
	Total Marks	100			
Engineering Graphics - II	Geometrical Tolerances – Indicating and interpreting		15		5
	Surface Texture – Indicating and interpreting		15		5
	Assembly Drawing – Reading assembly drawings		20		5
	Preparation of Shop floor Drawings		25		10
	Total Marks	100			
Modern Shop Floor Practice	5S	15			
	Gemba	10			

	Kaizen	15			
	Poka yoke	15			
	Just In Time	15			
	Introduction to TQM	7.5			
	Introduction to TPM	7.5			
	Muda, Mura, Muri	15			
	Total Marks	100			
Elective 1 - Painting technology	Safety in paint shop	05			
	Paint – Types and Applications	10			
	Painting - Methods of painting	15			
	Ovens – Types, Painting ovens , Applications	10			
	Automobile Painting Process - Understanding the Process / Steps and its purpose	25			
	Painting Defects and Trouble shooting	15			
	Handling of Painted Surfaces and Storage of Products	10			
	Adherence to Environmental requirements	10			
	Total Marks	100			
Elective 2 - Cutting tools	Cutting Tool Materials – Types and Applications	10			
	Cutting Tool Geometry – Tool angle, recommended angles	15			
	Tool Life – Factors affecting Tool life	20			
	Classification of Carbide Tools	10			
	Tools for CNC Machines – Selection Criteria, Referring catalogue	20			
	Coolants – Types, Specification and Application	10			
	Carbide Inserts and Insert Holders	15			

	Total Marks	100			
Elective 3 - Categories of Jewellery	Rings – Types	10			
	Ear Rings – Types	10			
	Neck Wear – Types	15			
	Bangles and Bracelets – Types	20			
	Studded Jewellery - Types	15			
	Enamel and other Coated Gold Jewellery	10			
	Other Categories	10			
	Total Marks	100			
Elective 4 – 4.1 Observation / Practice on painting	Evaluation of Observation Format		75		25
	Total Marks	-	100		
Elective 4 – 4.2 Mechanical lab - Auto	Milling – Practise on milling machine		45		15
	Grinding – Practise on surface grinding and cylindrical grinding machine		30		10
	Total Marks	100			
Elective 4 – 4.3/5.2 CAD lab Auto/Mfg.	Awareness and Familiarisation of Computer Aided Drawing		75		25
	Total Marks	100			
Elective 5 – 5.1 Mechanical Lab - Mfg	Exercise on Turning		20		7.5
	Exercise on Milling		40		10
	Exercise on Grinding		15		7.5
	Total Marks	100			
Elective 6 – 6.1 Mechanical Workshop - Jewellery	Familiarization of milling machine and operations		10		
	Exercise on Milling		15		5

	Familiarization of the following Processes at Jewellery Manufacturing Industry: Rolling Wire Drawing Tube Drawing Blanking Bending Forming Drawing Coining Embossing		30		10
	Metrology - Practice on right usage of the following measuring / checking instruments: Vernier caliper Micrometer Gauges Vernier bevel protractor Dial gauges		20		10
	Total Marks	100			
OJT	On the Job Training in the relevant sector		75		25
	Total Marks	-	100		
Employability skills	Becoming a Professional in 21st Century	25			5
	English skills - Writing	20			10
	Communication skills	30			10
	Total Marks	100			

Annexure 7: Assessment Strategy

1. ASSESSMENT STRATEGY:

The Criteria for assessment based on Modules, will be assigned marks proportional to its importance.

The assessment for the semester-based qualification is carried out by conducting Formative and Summative Assessments.

Regarding Theory – Sessional is based on Intermediate Tests, File / Assignments and Viva –voce: Semester end examination wherein for each Individual batch, A&E dept. at Corporate office, Bangalore creates unique question papers for theory part as well as practical – Theory comprises of MCQ and descriptive questions drawn randomly from Question Bank.

Regarding the practical part, the experiments/ exercises are performed by the trainees during the LAB Hours and the trainees are allowed to record the learning of it which will be carried as their Record Marks and one Lab Test and semester end examination. Semester end examination is outcome-based experiments/ exercises of the course will be given to trainees to perform and based on the performance the mark will be awarded. The passing criteria is based on practical's performance, viva or oral exam, Test and final semester end examination.

Theory and practical Examinations are carried out with Examiners under the overall supervision of the Assessment & Evaluation Dept.

Evaluation of Theory and Practical examination is carried out by the Trained Assessors (NTTF faculty members) under the supervision of Shopfloor Manager / Principal in a fair manner as per the assessment criteria set by A&E dept. of NTTF.

The Tabulation and processing of results shall be carried out under EDUSQUARE campus Software.

Assessors / Faculties are trained from time to time to upgrade their skills on various aspects such as conduction of assessments, teaching methodology etc.

Assessment comprises the following components:

- Job carried out in Labs / workshops
- Record book
- ONLINE Examination
- Answer sheet of assessment
- Viva-voce
- Semester end examination
- ON-THE-JOB training
- Attendance and punctuality

2. ASSESSORS:

Evaluation of Theory and Practical examination is carried out by the Trained Assessors (NTTF faculty members) in a fair manner as per the assessment criteria set by A&E dept. of NTTF.

Assessors / Faculties are trained from time to time to upgrade their skills on various aspects such as conduction of assessments, teaching methodology etc.

3. ELIGIBILITY TO APPEAR FOR THE EXAM:

- The candidates should have an attendance of a minimum 80% in a semester.
- The candidates should have secured minimum Sessional Marks in Theory and Practical

4. PASS CRITERIA:

To pass the Qualification, every trainee should score a minimum of 40% in each Theory and 50% in each Practical and 60% in OJT / Projects.

5. RESULTS AND CERTIFICATION:

The assessment results are backed by evidence collected by assessors. Successful trainees are awarded the Diploma certificate by NTTF Corporate Office.

6. ON THE JOB:

1. The candidate must score 60% to successfully complete the OJT.
2. Tools of Assessment that will be used for assessing whether the candidate is having desired skills and etiquette of dealing with customers, understanding needs and requirements, assessing the customer and perform Soft Skills effectively:
 - Videos of Trainees during OJT
3. Assessment will ensure that the candidate is able to:
 - Effective engagement with the customers
 - Understand the working of various tools and equipment.

7. SYSTEM OF GRADING:

An alphabetical letter grade will be assigned for each subject based on the total marks scored in the sessional and end semester examination.

Equivalent Grade Points are used: A = 9.5, B = 8.5, C = 7.5, D = 6.5, E = 5.5, F = 0 (FAIL), I = Incomplete (MP/AB/SP) Supplementary cleared = E

The student will be issued Semester Grade Report calculating SGPA / CGPA as follows:

$$\text{Semester Grade Point Average (SGPA)} = \frac{\sum (\text{No. of Credits} \times \text{Grade Point})}{\sum (\text{No. of Credits for the Program})}$$

$$\text{Cumulative Grade Point Average (CGPA)} = \frac{\sum (\text{SGPA} \times \text{total Credits of each semester})}{\text{Total credits Acquired.}}$$

Awarding of class:

a) Awarding of class for semester:

SGPA	Classification
8.5 and above	First class with distinction
7.5 to 8.4	First class
6.0 to 7.4	Second class
5.5 to 5.9	Pass class

b) Awarding of class for Programme:

First class with Distinction	Should have scored CGPA 8.5 and above and should have cleared all Semesters in the first attempt.
First class	Should have scored CGPA 7.5 to 8.4
Second class	Should have scored CGPA 6.0 to 7.4
Pass class	5.5 to 5.9

8. ASSESSMENT TOOLS

All assessment and evaluation activities are carried out under EDUSQUARE campus software which includes Formative assessment and Summative assessment.

- EDUSQUARE : NTTF ERP/CRM used for academic purpose EDUSQUARE erp.nttftg.com used as SaaS (software as a service) mode
- Digital Valuation System: Digital Valuation system is an innovative software solution which automates manual evaluation and help institutions to minimize the time, effort and human errors in the entire valuation process.
- Remote proctoring which includes AI based Auto Proctoring , Student authentication and Multi secure Exam browser

List of ICT Tools:

Desktop and laptops

Interactive White Board

CCTV Camera

Pen Drive

Video Conferencing

Biometric

Edusquare: NTTF ERP/CRM used for academic purpose Edusquare erp.nttftg.com used as SaaS (Software as a Service) mode

Networking: Includes Wireless access Points, Switches, Routers, Controllers across all NTTF

AWS Cloud: AWS Cloud computing platform to host NTTF website www.nttftg.com and used as backup storage.

Firewall: Network security device protecting our network by filtering traffic and blocking outsiders.

Microsoft (O365/M-365) – Email/office (Word, Excel, PPT, One Drive for all staff/students are provided using Microsoft O365 MDM (BYOD) policies implemented through M365 used as SaaS

Annexure 8: Model Curriculum

Semester – 1		Module Name: English Communication	Module Code: CP33101T
Sl. No.	Module Details	Theory Hours 25	
1	Reading and Listening comprehension	5h	
2	Construction of Sentences	5h	
3	Dictionary learning - Learn a word a day	3h	
4	Synonyms and Antonyms	4h	
5	Technical Report writing	5h	
6	Public Speaking Skills	3h	
	Total Hour	25 h	

Semester – 1		Module Name: Engineering Mathematics	Module Code: CP33102T
Sl. No.	Module Details	Theory Hours 30	
1	Units	2h	
2	Mensuration	4h	
3	Percentage, Ratio and Proportion	4h	
4	Basics of Algebra	4h	
5	Trigonometry	6h	
6	Graphs	4h	
7	Basic Statistics	6h	
	Total Hour	30 h	

Semester – 1		Module Name: Engineering Science	Module Code: CP33103T
Sl. No.	Module Details	Theory Hours 40	
1	Force, Motion and Energy	10h	
2	Stress and Strain	10h	
3	Corrosion and its Control	10h	
4	Magnetism	10h	
	Total Hour	40 h	

Semester – 1		Module Name: Manufacturing Technology - I	Module Code: CP33104T
Sl. No.	Module Details	Theory Hours 30	
1	Safety	2h	
2	Hand Tools - Types, Specification and Applications	3h	
3	Marking Tools	3h	
4	Drilling	6h	
5	Turning	6h	
6	Introduction to Measuring	4h	
7	Introduction to Welding	6h	
	Total Hour	30 h	

Semester – 1		Module Name: Metrology	Module Code: CP33105T
Sl. No.	Module Details	Theory Hours 25	
1	Introduction	2h	
2	Linear Measurement	5h	
3	Angular Measurement	3h	
4	Bore Measurement	3h	
5	Gauges	3h	
6	Dial Indicator	2h	
7	Slip Gauges	2h	
8	Introduction to Limits and Fits	5h	
	Total Hour	25 h	

Semester – 1		Module Name: Engineering Graphics - I	Module Code: CP33106P
Sl. No.	Module Details	Practical Hours 40	
1	Engineering script	2h	
2	Geometric Construction	4h	
3	Isometric views and Orthographic projection	10h	

4	Sectional views	10h
5	Dimensioning and providing tolerances	6h
6	Screw Threads	4h
7	Understanding Shop floor Drawing / Instructions	4h
Total Hour		40 h

Semester – 1 Module Name: Basic Mechanical Workshop Module Code: CP33107P		
Sl. No.	Module Details	Practical Hours 80
1	Usage of Steel Rule, Measuring Tape, Vernier Caliper, Micrometer, Bevel Protractor and Height Gauge	10h
2	Usage of Gauges - Go and No Go, Radius, Fillet and Feeler Gauges	15h
3	Usage of Hand Tools - Files, Spanner etc.	10h
4	Filing Practice, Precision Filing, Hacksawing Practice	15h
5	Drilling Practice	15h
6	Welding	20h
Total Hour		80 h

Semester – 1 Module Name: OJT Module Code: CP33108P		
Sl. No.	Module Details	Practice Hours 360
1	On the Job Training in the relevant sector	360 h
Total Hours		360 h

Semester – 1 Module Name: Employability Skills Module Code: CP33109T		
Sl. No.	Module Details	Theory Hours 30
1	Employability skills-Importance & applicability	10h
2	Behaviour skills	10h
3	Constitutional Values and Citizenship	10h
Total Hours		30 h

Semester – 2		Module Name: Manufacturing Technology - II	Module Code: CP33201T
Sl. No.	Module Details	Theory Hours 40	
1	Turning	3h	
2	Milling	6h	
3	Grinding	5h	
4	Casting	3h	
5	Forging	4h	
6	Extrusion	4h	
7	Press Tool Operations	8h	
8	Rolling	3h	
9	Mechanical Surface Finishing Process	4h	
	Total Hour	40h	

Semester – 2		Module Name: Material Technology	Module Code: CP33202T
Sl. No.	Module Details	Theory Hours 40	
1	Properties of Material	4h	
2	Ferrous Metals	14h	
3	Non Ferrous Metals and Alloys	7h	
4	Plastics	7h	
5	Hard Materials	5h	
6	Testing of Hardness	3h	
	Total Hour	40h	

Semester – 2		Module Name: Engineering Graphics – II	Module Code: CP33203P
Sl. No.	Module Details	Practical Hours 75	
1	Geometrical Tolerances	15h	
2	Surface Texture	25h	
3	Assembly Drawing	15h	

4	Preparation of Shop floor Drawings	20h
	Total Hour	75h

Semester – 2		Module Name: Modern Shop Floor Practice	Module Code: CP33204T
Sl. No.	Module Details	Theory Hours 40	
1	5S	5h	
2	Gemba	5h	
3	Kaizen	6h	
4	Poka yoke	5h	
5	Just In Time	5h	
6	Introduction to TQM	5h	
7	Introduction to TPM	5h	
8	Muda, Mura, Muri	4h	
	Total Hour	40h	

Semester – 2		Module Name: ELECTIVE 1 - Painting Technology	Module Code: CP33205T
Sl. No.	Module Details	Theory Hours 30	
1	Safety	2h	
2	Paint	4h	
3	Painting	6h	
4	Ovens	2h	
5	Automobile Painting Process - Understanding the Process / Steps and its purpose	8h	
6	Painting Defects and Trouble shooting	4h	
7	Handling of Painted Surfaces and Storage of Products	2h	
8	Adherence to Environmental requirements	2h	
	Total Hour	30h	

Semester – 2		Module Name: ELECTIVE 2 - Cutting Tools	Module Code: CP33206T
Sl. No.	Module Details	Theory Hours 30	
1	Cutting Tool Materials	5h	
2	Cutting Tool Geometry	5h	
3	Tool Life	4h	

4	Classification of Carbide Tools	4h
5	Tools for CNC Machines	5h
6	Coolants	2h
7	Carbide Inserts and Insert Holders	5h
	Total Hour	30h

Semester - 2		Module Name: ELECTIVE 3 - Categories of Jewellery	Module Code: CP33207T
Sl. No.	Module Details	Theory Hours 30	
1	Rings	3h	
2	Ear Rings	5h	
3	Neck Wear	5h	
4	Bangles and Bracelets	5h	
5	Studded Jewellery	5h	
6	Enamel and other Coated Gold Jewellery	2h	
7	Other Categories	5h	
	Total Hour	30h	

Semester - 2		Module Name: ELECTIVE 4 – 4.1 Observation / Practice on Painting	Module Code: CP33208P
Sl. No.	Module Details	Practical Hours 15	
1	Observation / Practice on Painting at Industry	15h	

Semester - 2		Module Name: ELECTIVE 4 – 4.2 Mechanical Lab Auto	Module Code: CP33209P
Sl. No.	Module Details	Practical Hours 15	
1	Milling	15h	
2	Grinding		
	Total Hour	15h	

Semester - 2		Module Name: ELECTIVE 4/5 – 4.3/5.2 CAD Lab Auto/mfg.	Module Code: CP33210P/CP23212P
Sl. No.	Module Details	Practical Hours 15	
1	Awareness and Familiarisation of Computer Aided Drawing	15h	

Semester - 2		Module Name: ELECTIVE 5 – 5.1 Mechanical Lab Mfg	Module Code: CP33211P
Sl. No.	Module Details	Practical Hours 30	

1	Exercise on Turning	10h
2	Exercise on Milling	10h
3	Exercise on Grinding	10h
	Total Hour	30h

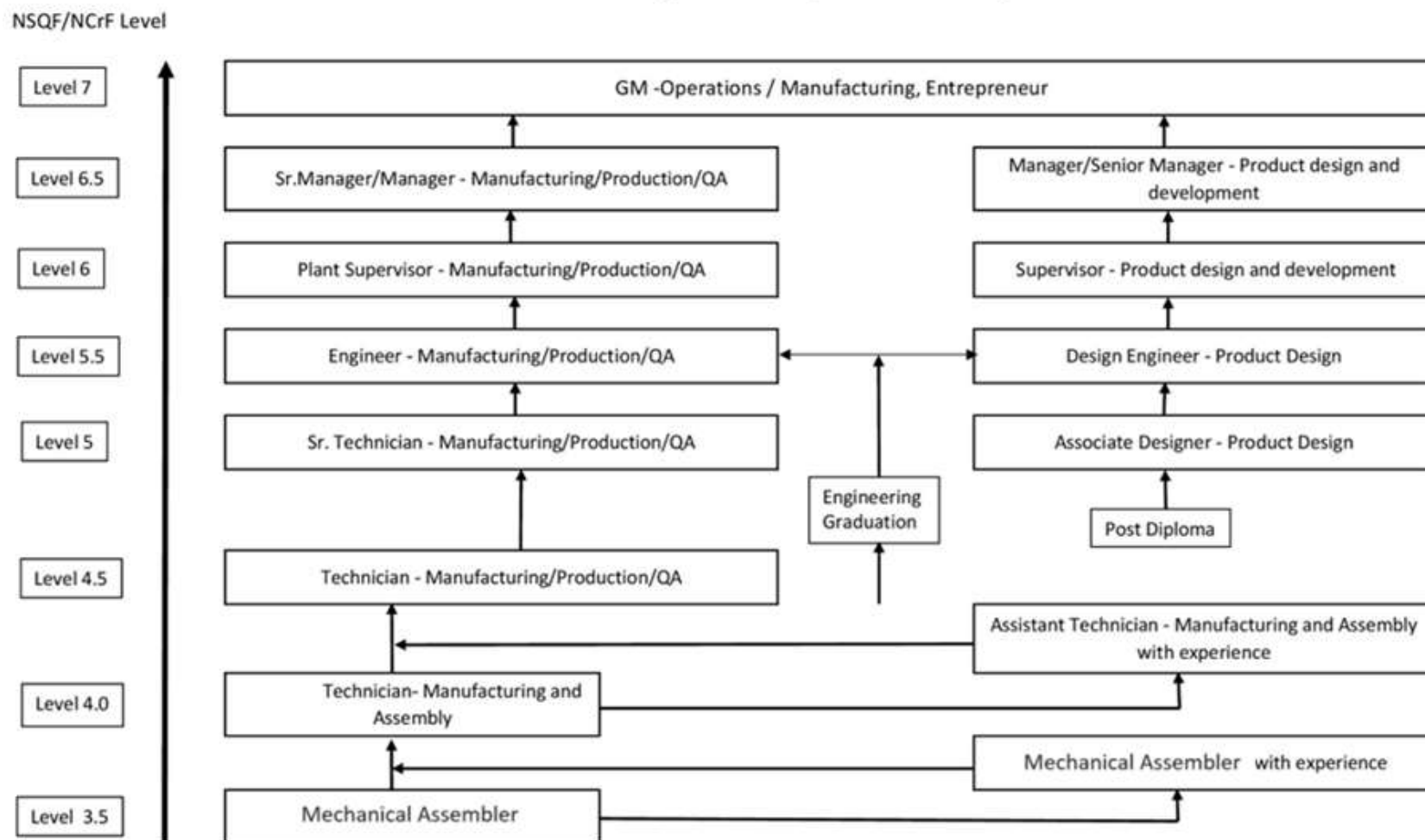
Semester - 2		Module Name: ELECTIVE 6 – 6.1 Mechanical Workshop II Jewellery	Module Code: CP33213P
Sl. No.	Module Details	Practical Hours 45	
1	Familiarization of milling machine and operations	45h	
2	Exercise on Milling		
3	Familiarization of the following Processes at Jewellery Manufacturing Industry: Rolling Wire Drawing Tube Drawing Blanking Bending		
	Forming Drawing Coining Embossing		
4	Metrology - Practice on right usage of the following measuring / checking instruments: Vernier caliper Micrometer Gauges Vernier bevel protractor Dial gauges		
	Total Hour	45 h	

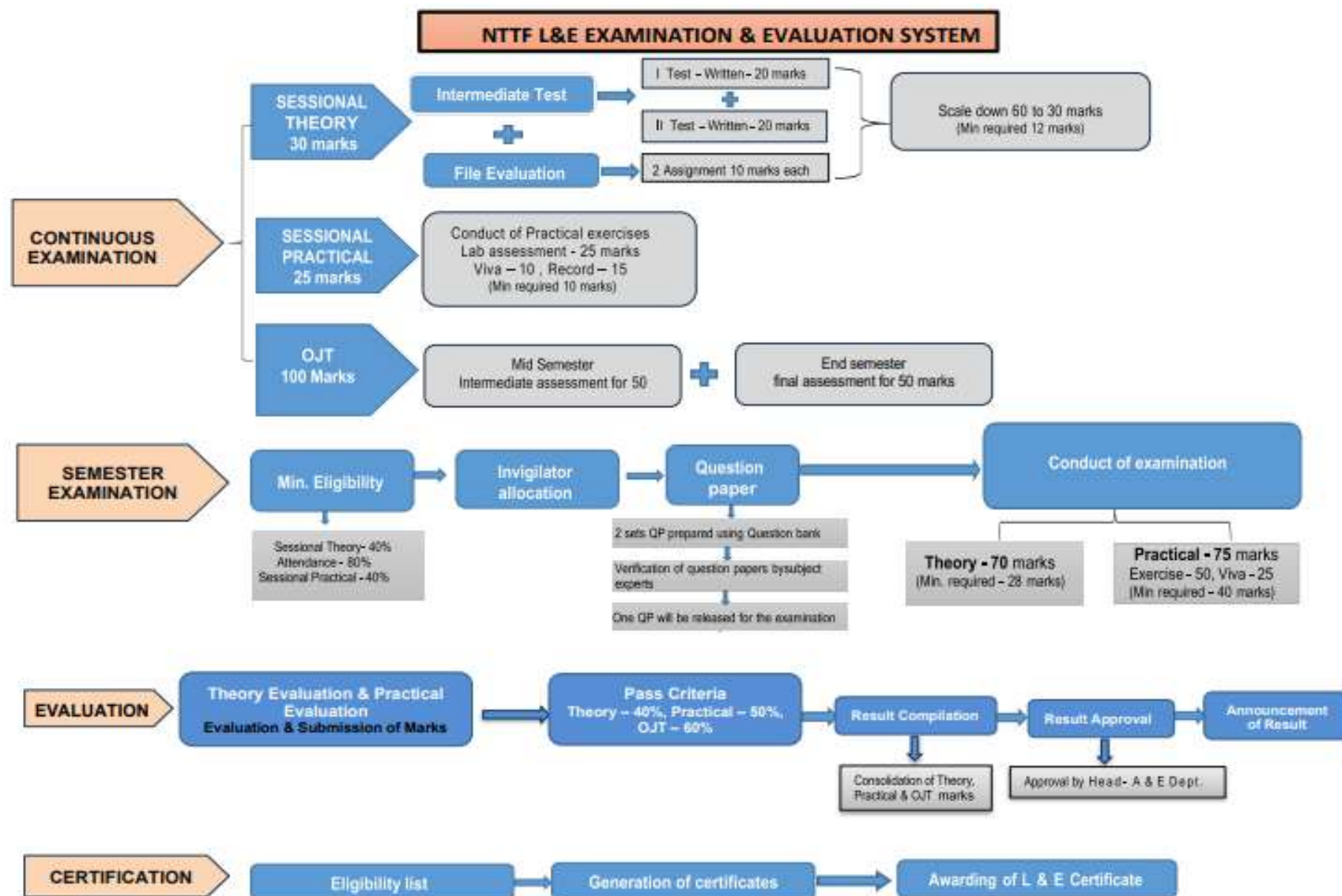
Semester - 2		Module Name: OJT	Module Code: CP33218P
Sl. No.	Module Details	Practice Hours 360	

1	On the Job Training in the relevant sector	360 h
	Total Hours	360 h

Semester - 2		Module Name: Employability Skills	Module Code: CP33219T
Sl. No.	Module Details	Theory Hours 30	
1	Becoming a Professional in 21st Century	10h	
2	English skills – Writing	10h	
3	Communication skills	10h	
	Total Hours	10 h	

Annexure 9: Career Progression
Sector: Manufacturing, Automotive, Gems & Jewellery



Annexure 10: Assessment SOP

Annexure 11: Occupational Map
Sector Name: Manufacturing

As per NCrf		As per NCO-2015	Sub-Sector 1/Automotive, Manufacturing, Gems & Jewellery	
NCrf Level (1-7)	Level Descriptors	NCO-15 -- Family (First 4 digits code/s for the given level cross cutting the OM Sub-Sectors/Occupations)	Occupation 1/Process control , Manufacturing, Production	Occupation 2/ Product design and development.
Level 7.0	1. Professional Theoretical Knowledge: Advanced knowledge with critical understanding of emerging developments 2. Professional and Technical Skills/ Expertise: Highly specialized skills, transdisciplinary skills, leadership skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Cross cultural competency, transformational leadership 4. Broad Learning Outcomes: Apply acquired advanced technical skills, technical appraisal and reviews 5. Responsibility: Business Management (like GM/ CEO / CXO, etc.)	1321	GM - Operations/ Manufacturing, Entrepreneur	
Level 6.5	1. Professional Theoretical Knowledge: Advanced multidisciplinary and specialized knowledge 2. Professional and Technical Skills/ Expertise: Advanced Technical and Managerial Skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Leadership, effective resource management 4. Broad Learning Outcomes: Judgement in complex problems 5. Responsibility: Vertical/ Business unit management –Manager or Senior Manager	1321, 1213, 2144	Sr. manager/Manager - Manufacturing/Production/QA Automobile, Manufacturing, Jewellery	Manager/Senior Manager- Product Design & development Automobile, Manufacturing, Jewellery
Level 6.0	1. Professional Theoretical Knowledge: Multidisciplinary and specialized knowledge 2. Professional and Technical Skills/ Expertise: Range of skills along with specialized domain skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Entrepreneurial mindset, self-management 4. Broad Learning Outcomes: Judgement / decision making – specialized 5. Responsibility: Team leader – Assistant technical supervisor, technical supervisor or Assistant/ deputy manager	3115, 3122, 2144	Plant Supervisor - Manufacturing/Production/QA Automobile, Manufacturing, Jewellery	Supervisor - Product Design & Development Automobile, Manufacturing, Jewellery
Level 5.5	1. Professional Theoretical Knowledge: Specialized knowledge	2141, 2144		

	2. Professional and Technical Skills/ Expertise: Specialized skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Team readiness, self-entrepreneurship readiness 4. Broad Learning Outcomes: Specialized/ complex jobs/tasks 5. Responsibility: Self and team responsibility – Sr. Technician or Master Technician		Engineer - Manufacturing/Production/QA Automobile, Manufacturing, Jewellery	Design Engineer - Product Design Automobile, Manufacturing, Jewellery
Level 5.0		2144, 3115, 7231	Sr. Technician - Manufacturing/Production/QA Automobile, Manufacturing, Jewellery	Associate Designer - Product Design Automobile, Manufacturing, Jewellery
Level 4.5	1. Professional Theoretical Knowledge: Range of knowledge 2. Professional and Technical Skills/ Expertise: Range of technical skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Team readiness & Enterpreurial readiness-with guidance. 4. Broad Learning Outcomes: Carry out Range of tasks with minimum supervision 5. Responsibility: Accountable/ responsible - Technician	2144, 3115, 7231	Technician - Manufacturing/Production/QA Automobile, Manufacturing, Jewellery	Study Post Diploma
Level 4.0	1. Professional Theoretical Knowledge: Range of knowledge 2. Professional and Technical Skills/ Expertise: Range of technical skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Team Member-Follow instructions 4. Broad Learning Outcomes: Carry out Range of tasks with supervision 5. Responsibility: Accountable/ responsible - Jr. technician/Assistant	7231, 3115, 7313	Assistant Technician – Manufacturing and Assembly Automobile, Manufacturing, Jewellery	
Level 3.5	1. Professional Theoretical Knowledge: Range of knowledge 2. Professional and Technical Skills/ Expertise: Range of technical skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Team Member-Follow instructions 4. Broad Learning Outcomes: Carry out Range of tasks with supervision. 5. Responsibility: Accountable/ responsible - Jr. technician/Assistant	3139, 7231, 7233, 7313	Mechanical assembler Automobile, Manufacturing, Jewellery	

Annexure 12: Key Learning Outcome

SL. NO.	SUBJECT NAME	KNOWLEDGE AND UNDERSTANDING	TECHNICAL & PROFESSIONAL SKILLS	APPLICATION OF KNOWLEDGE AND SKILLS
FIRST YEAR				
1	English Communication (CP33101T)	Understand, Comprehend grammar. Formation of simple sentences. Identify and express the antonym and synonyms.	Writing skills Public Speaking. Read and comprehend. Make meaningful sentences. Use dictionary.	Write Business Letters Reports as necessary in Profession. Interact, Communicate during Interviews, debates, and Group Discussion for Career Development. Develop Presentation Skills.
2	Engineering Mathematics (CP33102T)	Interpret Different systems of Units and also convert from one unit to another. Perform Area and Volume Calculations Perform Arithmetic operations. Understand various Trigonometric terms, theorems and equations and their utility. Knowledge and understanding on statistics, probability and Matrix. Understand rpm calculation for drilling, Turning, Milling and grinding	Use Trigonometry for Engineering Calculations. Ability to solve various mathematical problems. Determine Ratio, proportions and percentages. Application of Statistical methods for data interpretation.	Apply Statistics in Interpreting Data. Use appropriate units and measurements during interactions and discussions in the work area. Determine dimensions, perimeter, Area and Volume using associated formulas for engineering needs.
3	Engineering Science (CP33103T)	Define Speed, Velocity and Acceleration State Newton's Laws of Motion and Application	Understand the fundamental principles of physics related to force, motion, and energy. Understand the mechanical properties of materials, such as	Ability to apply mathematical concepts and equations to solve problems related to force, motion, and energy. Knowledge of different types of

		Define Work, Power and Energy Explain relationship between Power and Torque Define Stress and Strain Explain Tensile, Shear and Compressive Strain. Explain Modulus of Elasticity, Modulus of Rigidity and Poisson's Ratio. Explain Electrochemical Theory of Corrosion Explain different types of Corrosion Explain relationship between Magnetism and Electricity Explain Laws governing Electromagnetic Induction	elasticity, rigidity, and how they relate to stress and strain. Understand the different types of corrosion, their mechanisms, and their effects on materials. Describe methods to minimise / eliminate corrosion of metals.	corrosion protection methods, such as coatings, cathodic protection, and corrosion inhibitors. Knowledge of the different types of magnets.
4	Manufacturing Technology-I (CP33104T) Manufacturing Technology - II (CP33201T)	Explain the Importance of Health and Safety Identify and Explain PPE Follow Safe Working Practices to Prevent accidents Explain Fire Safety, types of fires and fire extinguishers to extinguish the fire Exhibit and maintain procedures to achieve a safe working environment.	Exhibit and maintain procedures to achieve a safe working environment. Follow Emergency Procedures – raising alarm, evacuation rules, Identifying assembly point etc., Prepare accident and Incident reports Calculate RPM of tool/job for the given cutting speed	Knowledge of health and safety regulations and practices relevant to manufacturing and protective measures. Work Effectively with others. Do Basic First Aid when required in Emergencies Follow good housekeeping Practices Perform marking operation on Jobs

		Accurately receive information and pass on the information to authorized person Display appropriate Communication etiquette Demonstrate responsible and discipline behaviour at workplace Escalate grievances and problems to authority to resolve and avoid conflict Describe and Explain the classification, use and selection of hand tools and Power Tools. Identify and select work holding and tool holding devices for drilling, reaming, and tapping Identify and Specify Reamers, Taps, Dies Explain feed and depth of cut in turning operations Explain Taper and Taper Turning Operations Explain Different Types of Cutting Tool material and their Characteristics, Specifications and Applications Explain Different Types of Cutting Fluids and Lubricants and their	Identify and select Work holding and Tool holding devices for Turning Operations Identify and select work holding and tool holding devices for Milling Operations Identify and Specify milling cutters Identify and Specify grinding wheels Select grinding wheels as per operations Identify and State the Process Applications, Advantages and Disadvantages of Sand casting, Investment casting and Die casting Understand different Mechanical Surface Finishing Process	Perform drilling, counter boring, counter sinking, Reaming and Tapping Operations Knowledge on different milling processes Knowledge of different manufacturing processes, including their advantages, disadvantages, and limitations, and their applications in various industries. Ability to select appropriate manufacturing equipment and tools for specific tasks.
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		Characteristics, Specifications and Applications Specify milling machine Explain different milling processes Explain feed and depth of cut in milling operations. Explain Grinding Operations Explain different Surface grinding operations and Cylindrical grinding operations Describe Forging, Extrusion and Rolling Explain Honing Operation, Lapping Operation, Polishing Operation, Buffing Operation, Tumbling Operation		
5	Metrology (CP33105T)	Explain the Importance of Metrology in Industry Select right type of measurement for Linear measurement Select right type of measurement for angular measurement Select right type of Bore Measuring Instrument Explain types of Dial Indicators	Perform precision Linear measurements, Angular measurements, Bore measurements Use gauges for measuring internal and external dimension , taper, thread, thread pitch, radius, clearance and profiles Define Clearance, Interference and Transition as per BIS Select fits for defined purposes	Linear Measurements- Using different measuring devices and options. Use of different gauges to measure different parameters of engineering. Use dial Indicators in workshop/inspection activities Use Sine bar for accurate angular measurement Measuring/Inspection Equipment used in Industry

		Classify gauges according to type, purpose and design Explain grades of slip gauges Explain Limits, Fits and Tolerances as per BIS Determine Upper and Lower values of Clearance, Interference and Transition as per BIS		
6	Engineering Graphics - I (CP33106P) Engineering Graphics - II (CP33203P)	State Importance of engineering drawing Proficiency in geometric construction Refer and use SP46 Indicate Dimensional Tolerances as per BIS Indicate Geometrical Tolerances as per BIS Draw Sectional Views Interpret conventional representations in drawings Indicate Surface Texture symbols on drawing	Explain the difference between orthographic and isometric projection. Able to draw Isometric Projection Able to draw Orthographic Projection in 1st angle and 3rd angle Dimension Drawings as per BIS Interpreting Surface Texture symbols given in Drawing Interpret Assembly Drawings	Draw Orthographic projection, Isometric drawing, different types of sectioning and draw sectional views Draw the diagrams as per given dimensions Preparation of Part Drawings from simple assembly drawings Preparation of Shop floor drawings
7	Basic Mechanical Workshop (CP33107P)	Filing, Hack sawing, Drilling, Counter boring, Counter sinking, Tapping and Reaming. Drilling, Reaming, Tapping	Determine least count, measure physical variable quantities. SOP for use of different hand tools and Gauges.	Marking practice Use appropriate measuring instruments in measure variables in the job role. Filing, Drilling, Turning, Milling and

		Plain turning, Step turning, Taper turning Identify different measuring instruments and their purposes.	Welding Safety AC and DC Arc Welding Process and parameters	Grinding process. Practice on DC Arc Welding Practice on MIG Welding
8	Material Technology (CP33202T)	Classify Engineering Materials Explain Properties of Materials Describe Various Types of Ferrous Metals Explain Types, Properties and Application of Cast Iron, Steel, Non - Ferrous metals and Alloys Differentiate between Thermoplastics and Thermoset Plastics Explain Testing of Hardness	Understand the properties, characteristics, and behaviour of various materials and their applications. State Types, Grades, Properties and Application of Stainless Steel Select Standard Steel Sections and Sheets State Types, Properties and Application of Thermoplastics State the Properties and application of hard materials	Knowledge of the physical, mechanical, and chemical properties of materials and how they relate to their performance in different applications. Knowledge on Properties, Specification and Application of Materials used in Industry.
9	Modern Shop floor Practices (CP33204T)	Explain Concepts and Objectives of Quality Circle Explain Concept of 5S and participate in 5S Activities Explain JIT Explain and Understand Poka-yoke Describe concepts of Kaizen Explain MUDA, MURA, MURI Explain TPM and TQM	Participate in Quality Circle Activities Participate in Gemba, Kaizen Participate in 5S Activities Poka-yoke - Six mistake proofing techniques	Apply 5s and KAIZEN in Work Place Concepts of TPM and TQM Framework

10	Painting Technology (CP32205T) - Elective	Observe Safety Practices in Painting Describe Types, Specification and Application of Paints for Automobiles Explain Types and Uses of Putty and Primers Explain Types of Painting Ovens Describe and Understand Steps in Automobile Painting Process	Types, Specification and Application of Paints for Automobiles Appreciate handling methods of Painted Surfaces	Perform Pre-Treatment for Painting Perform Spray Painting Adhere to Environmental requirements. Identifying Painting Defects and Troubleshoot.
11	Cutting Tools (CP33206T) Elective	Explain the Properties of Cutting Tool Materials Describe factors affecting Tool Life Explain the Function, Advantages, Types, Specification and Application of Coolants Describe Commonly used Carbide insert shapes and their Specification	Cutting Tool Geometry for Single Point and Multi Point Cutting Tools Identify and Specify Insert Holders	Select Cutting Tools for different materials from Tool Catalogue Select Tools for different Cutting Operations
12	Categories of Jewellery (CP35207T) - Elective Ability to understand jewellery types and its making process	Explain Ring Making Process Explain Types of Ear Ring and Ear Ring Making Process Explain Types of Bangles and Bracelets and their Making Process Explain Types and Components of Studded Jewellery Explain Components of Enamel and Other Coated Jewellery	Identify the appropriate types and making processes for making rings, ear rings, neck wear, bangles, bracelets, studded jewellery, enamel and other coated jewellery	Selection and understanding the market requirement of Traditional Indian jewellery, Bridal, Antique and Designer Jewellery

		Describe Traditional Indian Jewellery Describe Bridal, Antique and Designer Jewellery		
13	Observation / Practice on Painting (CP32208P) - Elective	Observation / Practice on Painting at Industry		Observation / Practice on Painting at Industry
14	Mechanical Lab – Auto (CP33209P) - Elective	Filling, Hack sawing, Drilling, Counter boring, Counter sinking, Tapping and Reaming. Drilling, Reaming, Tapping Plain turning, Step turning, Taper turning Identify different measuring instruments and their purposes.	Determine least count, measure physical variable quantities. SOP for use of different hand tools and Gauges.	Marking practice Use appropriate measuring instruments in measure variables in the job role. Filing, Drilling and Turning process.
15	CAD Lab – Auto (CP33210P) Elective CAD Lab – Mfg (CP33212P)- Elective	Interpret Assembly Drawings Prepare Shop floor Drawings	Interpreting Surface Texture symbols given in Drawing	Computer Aided Drawing - Practice
16	Mechanical Lab - Mfg (CP33211P) Elective	Filling, Hack sawing, Drilling, Counter boring, Counter sinking, Tapping and Reaming. Drilling, Reaming, Tapping Plain turning, Step turning, Taper turning Identify different measuring instruments and their purposes.	Determine least count, measure physical variable quantities. SOP for use of different hand tools and Gauges.	Marking practice Use appropriate measuring instruments in measure variables in the job role. Filing, Drilling, Turning, Milling and Grinding process.

17	Mechanical workshop II – Jewellery (CP33213P) - Elective	Read Engineering Drawings Identify different measuring instruments and their purposes. Identify different hand tools, and gauges.	Identify the appropriate processes to be performed from the Engineering Drawings.	Perform different operations on the assigned job to achieve defined Specifications and dimensions. Use appropriate hand tools and Gauges in the job role. Filing and Drilling process.
18	OJT (CP33108P) OJT (CP33218P)			On the Job Training in the relevant sector
19	Employability Skills (CP33109T) Employability Skills (CP33219T) Ability to behave appropriately. Understand Constitutional Values/ role of citizen. Ability to communicate appropriately. Understand Diversity and Inclusion.	Knowledge and understanding of all Human relation Principles. Knowledge and understanding of the constitution of Indian state and the preamble of the constitution. Fundamental Duties of the citizen of India. Knowledge and understanding of types of communication. Good understanding about Diversity and Inclusion in the workplace.	Able to practice the HRP with peer groups to maintain healthy relationship. Practice the constitutional values in the society. Being ethical and moral in the society following all the fundamental duties in the society. Practice effective communication with the peers, superiors and subordinates with empathy and care. Practice a sense of belonging in the society leaving behind all differences due to race, ethnicity, gender, age, identity etc.	Follow all the skills in the work place and society to have peace and harmony with superiors and subordinates.

Annexure: Acronym and Glossary**Acronym**

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework
NOS	National Occupational Standard(s)
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework
OJT	On the Job Training

Glossary

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