

QUALIFICATION FILE

Mechanical Fitter

- ☐ 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 Fitter								
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 Fitter						
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-01029-2023-V1-NTTF	6. NCrF/NSQF Level: 3.5							
7.	Award (Certificate/Diploma/Advance Diploma/ Any Other) (Wherever applicable specify multiple entry/exits & provide details in annexure)	Certificate								
8.	Brief Description of the Qualification	The Candidate will be able to do Mechanical Fitting & Assembly, read the drawing, Work on conventional machines. The subjects covered in this programme are - CAD, Production technology, Metrology, Material Technology, Workshop Practical, Metrology, Basic Electrical and electronics, Applied science, Employability Skills.								
9.	Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	a. 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 – 40	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 <i>(Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)</i>	☐ Offline ☐ Online ☒ Blended					
		Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT/Project Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)
		Classroom (offline)	360	565	90		1015
		Online	120	65			185
		(Refer Blended Learning Annexure for details)					
14.	Aligned to NCO/ISCO Code/s <i>(if no Code is available mention the same)</i>	NCO Code – 2015.8211.1202, 2015.7233.0101, 2015. 7412.0202					
15.	Progression path after attaining the qualification <i>(Please show Professional and Academic progression)</i>	Professional Progression: After Completion can work as Mechanical Fitter. After Completion of 3 years of Full Time Programme and after 3 years of Industry Experience the Job Holder can work as Tool and Die Engineer, Process Engineer, Product Design Engineer, Tool Designer, Digital Manufacturing engineer, Quality engineer and Additive Manufacturing Engineer. Academic Progression: Advanced certificate-Assistant Toolmaker, Diploma -Tool Engineering and Digital Manufacturing, Post Diploma, B. VoC and B.Tech Degree Course in Relevant field.					
16.	Other Indian languages in which the Qualification & Model Curricula 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 (30% seats 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 <i>(In case of CS or MS, provide details of both Lead AB & Supporting ABs)</i>	Name: Mr. R Rajagopalan Position in the Organization: Joint Managing Director Email: rg@nttf.co.in Tel number: 080 - 28390215 Contact Number: 9844013448 Website: nttftg.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 to the curriculum document. – In Annexure

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

Sl. No	NOS/Module Name	NOS/Module Code & Version	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 – 1																
1	English – 1	CP01101T	Core	3.5	20	60	-	-	-	60	62.5	-	-	37.5	100	
2	Mathematics – 1	CP01102T	Core	3.5		60	-	-	-	60	100	-	-	-	100	
3	Applied Science	CP01103T	Core	3.5		40	-	-	-	40	100	-	-	-	100	
4	Metrology – 1	CP01104T	Core	3.5		20	-	-	-	20	100	-	-	-	100	
5	Production Technology – 1	CP01105T	Core	3.5		30	-	-	-	30	100	-	-	-	100	
6	Basics of Computer	CP01106P	Core	3.5		-	20	-	-	20	-	80	-	20	100	
7	CAD- Fusion 360 Lab	CP01107P	Core	3.5		-	20	-	-	20	-	80	-	20	100	
8	Applied Science Lab	CP01103P	Core	3.5		-	20	-	-	20	-	80	-	20	100	
9	Engineering Drawing	CP01108P	Core	3.5		-	60	-	-	60	-	80	-	20	100	
10	Workshop Practical	CP01109P	Core	3.5		-	240	-	-	240	-	80	-	20	100	
11	Employability Skill	CP01110T	Core	3.5		30	-	-	-	30	75	-	-	25	100	
Duration (in Hours)/ Total Marks					20	240	360	-	-	600	537.5	400		162.5	1100	
Semester – 2																
12	English - 2	CP01201T	Core	3.5	20	40	-	-	-	40	62.5	-	-	37.5	100	
13	Mathematics – 2	CP01202T	Core	3.5		40	-	-	-	40	100	-	-	-	100	
14	Metrology – 2	CP01207T	Core	3.5		20	-	-	-	20	100	-	-	-	100	
15	Production Technology – 2	CP01206T	Core	3.5		30	-	-	-	30	100	-	-	-	100	
16	Basic Electrical & Electronics	CP01209T	Core	3.5		40	-	-	-	40	100	-	-	-	100	

17	Material Technology	CP01208T	Core	3.5		40	-	-	-	40	100	-	-	-	100	
18	CAD Fusion 360 Lab	CP01205P	Core	3.5		-	45	-	-	45	-	80	-	20	100	
19	Engineering Drawing Lab	CP01204P	Core	3.5		-	60	-	-	60	-	80	-	20	100	
20	Workshop Practical	CP01222P	Core	3.5		-	165	-	-	165	-	80	-	20	100	
21	Employability Skill	CP01223T	Core	3.5		30	-	-	-	30	100	-	-	-	100	
22	OJT	CP01224P	Core	3.5				90		90	75			25	100	
Duration (in Hours)/ Total Marks					20	240	270	90	-	600	737.5	240	-	122.5	1100	
Total for 1-year Programme					40	480	630	90	-	1200	1275	640	-	285	2200	

Elective 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																

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: Please specify **any one** of the following:**Minimum Pass Percentage:** (Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear assessment)

Minimum 40% in each Theory module, 50% in each Practical module and 60% in Project.

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 <i>(If "Yes", details to be provided in Annexure)</i>
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>	Blended theory (online and offline in the centre) and practical
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 predict very high growth on automobile and capital goods sector in India. 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 –Electronic Components, Electrical Components, and Auto Components etc. The above two will lead to Higher requirement in Press tool, Moulds and Jigs and Fixtures This calls for qualified Tool makers in large numbers in the Future. 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 which will require Qualified Technicians in Tool Engineering and Digital manufacturing
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 Digital Manufacturing Engineer, Tool Room Technician, 3D Printing Technician has new job roles emerging in the Manufacturing Sector.
4.	Number of Industry validation provided: 47
5.	Estimated nos. of persons to be trained and employed: 1200/ 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 (<i>Mandatory</i>)	Yes
2.	Annexure 2: List of tools and equipment relevant for qualification (<i>Mandatory, except in case of online course</i>)	Yes
3.	Annexure 3: Industry Validations Summary	Yes
4.	Annexure 4: Training & Employment Details	Yes
5.	Annexure 5: Blended Learning (<i>Mandatory, in case selected Mode of delivery is “Blended Learning”</i>)	Yes
6.	Annexure 6: Detailed Assessment Criteria (<i>Mandatory</i>)	Yes
7.	Annexure 7: Assessment Strategy (<i>Mandatory</i>)	Yes
8.	Annexure13: Multiple Entry-Exit Details (<i>Mandatory, in case qualification has multiple Entry-Exit</i>)	No
9.	Annexure: Acronym and Glossary (<i>Optional</i>)	Yes
10.	Supporting Document: Model Curriculum (<i>Mandatory – Public view</i>)	Digital content available to trainees through Edusquares ERP (Will be made public after the qualification is approved) (Annexure 8)
11.	Supporting Document: Career Progression (<i>Mandatory – Public view</i>)	Yes (Annexure 9)
12.	Supporting Document: Occupational Map (<i>Mandatory</i>)	Yes (Annexure 11)
13.	Supporting Document: Assessment SOP (<i>Mandatory</i>)	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**Mechanical Fitter**

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.	• Application of basic mathematical concepts for calculations of speed, feed, depth of cut machining, taper turning 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, composites and ceramics. • Demonstrate manual working methods and equipment. Identify processes to be performed from the drawings.	3.5
Professional and Technical Skills/ Expertise/ Professional Knowledge	• Execute Different manual metal working Processes. • Execute conventional machining. • Perform Measuring/Inspection Equipment used in tooling. • Demonstrate Professional Knowledge on Manufacturing Procedure of simple Press Tools. • 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 simple Press Tool.	3.5

		Follow safe working practices to prevent accidents.	
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. - 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 - Manufacturing Tool Parts Using Manual, Conventional machines.	- Good Communication with Peers, superiors both verbal and written, Good on Presentation Skills, QC, 5S. - 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. - Perform assembly of simple Press Tool.	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 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 Manufacture of Components of Press Tool under Minimum Supervision. - Perform manual machining operations to achieve required dimensions and fits. - Follow the standard procedures in Fulfilling tasks Assigned to them.	3.5

Annexure 2: Tools and Equipment (Lab Set-Up)
Tools and Equipment requirement for a batch of 30 Trainees

Hand Tools / Equipment - 1st Year		
Sl. No.	Name of the Tool and Equipment	Quantity
1	Work Bench with Lockers – 4 vices / Bench	8
2	Bench Vice – 125 mm	30
3	Set of File tools	30
4	Steel Rule 150mm and 300mm	30 each
5	Vernier Caliper 150mm, LC 0.02mm	30
6	Scriber	30
7	DOT Punch and Centre Punch	30
8	Try Square, 100mm X 75mm	30
9	Hack Saw with Blade – 300mm	30
10	Hammer 200g and 500g	30 each
11	Cast Iron Surface Plate 1000 X 630 with stand	1
12	Angle Plate - 200 X 100	1
13	V – Block	1
14	Vernier Height Gauge, least count 0.02, 0 - 600 mm	1
15	V block 80mmsq	1
16	Magnetic V block	1
17	Double Ended Spanner Set 6 to 22mm	1
18	Ring Spanner set 6 to 22mm	1
19	Adjustable Spanner	1
20	Philips Screwdriver set	1

21	Flat Screw Drivers Set	1
22	Plier set	1
23	Circlip Pliers – Straight	1
24	Circlip Pliers – Bent	1
25	Flat Chisels Set	5
26	Allen Key Set (mm sizes) 1.5 to 12 mm	2
27	Allen Key Set (inch Sizes) 1/16 to 3/8	2
28	Spirit Level (0.5mm accuracy, with magnet)	1
29	Tin Cutter with Spring	1
30	Bearing puller Set	1
31	Centre Punches and Drift Punches set	10
32	Pin Punches Set	10
33	Heavy Duty Pipe Wrench	1
34	Cross Peen Hammer	1
35	Ball Peen Hammer	1
36	C-Clamp Size: 150 mm	5
37	Diamond Coated Files	5
38	Drill Machine Portable - Maximum Ø6 mm	1
39	Portable Angle Grinder	1
40	Socket set - 24 pieces	2
41	Set of cutting tools	1
Metrology Lab - 1st Year		
Sl. No.	Name of the Tool and Equipment	Quantity
1	Micrometer 0 - 25, 0.01 least count	3
2	Micrometer 25 - 50, 0.01 least count	3

3	Micrometer 50 - 75, 0.01 least count	1
4	Digital Micrometer 0 - 25, 0.001 least count	1
5	Digital Micrometer 25 - 50, 0.001 least count	1
6	Digital Micrometer 50 - 75, 0.001 least count	1
7	Vernier Caliper 200 mm, 0.02 least count	1
8	Dial Vernier – 200mm, 0.01 least count	1
9	Digital Vernier – 250mm, 0.01 least count	1
10	Cast Iron Surface Plate 1000 X 630 with stand	1
11	Granite Surface Plate 1000 X 630 with stand	1
12	Try square 100 X 70	2
13	Straight Edge 100 – 150	2
14	Angle Plate - 200 X 100	1
15	Sine Bar - 250mm	1
16	Sine Plate - 250 X 150	1
17	Vernier Height gauge, least count 0.02, 0 - 300 mm	1
18	Digital Height gauge, least count 0.01, 0 - 300 mm	1
19	Dial Indicator Plunger type, 0.01, range 0 – 10 mm	1
20	Digital Dial Indicator Plunger type, 0.001, range 0 – 8 mm	1
21	Dial Indicator Lever type, 0.01, range 0 – 0.8 mm	1
22	3-point Internal Micrometer	1
23	Combination set	1
24	Bevel Protractor, least count 5'	1
25	Slip Gauge 87 pieces (Inspection grade)	1
26	Radius Gauge up to 7.5mm	2
27	Pitch Gauge	1

28	Feeler Gauge 13 leaves150mm long		2
29	Spirit level		1
30	Magnetic Stand		2
Machines 1 st Year			
Sl. No.	Machine	Recommended Specification	Quantity
1	Bench Lathe	Machining Dia: 50mm x 400mm long	1
2	Centre Lathe	Machining Dia: 100mm x 650mm long	2
3	Vertical Milling Machine	Machining size: 250mm x 150mm x 100mm H	1
4	Surface Grinding Machine	Machining size: 450mm x 150mm x 100mm H	1
5	Engraving Machine	Machining Area: 150mm x 50mm – CNC	1
6	Bench Drilling Machine	Maximum Dia: On steel – Ø10m	3
7	Bench Grinder	Wheel Dia: 200mm x 20mm thick - 2 sided	1
8	Power Hacksaw	350 mm	1
Applied Science Equipment for 1 st Year			
Sl. No.	Machine		Quantity
1	Force table – Diameter 40 cm with Weights		2
2	Spring balance 5N & 10N		2 each
3	Slotted Weights, 10 X 100gm		2
4	Simple pendulum Set - (Bob Pendulum) with Stand		1
5	Balance stand - Wooden Wedge on Pillar		2
6	Stopwatch – Digital		1
7	Spring Constant Apparatus with weights		2
8	Retort stand - With Boss Head and Clamp		2
9	Flow Cup Viscometer stand		2
10	Measuring Jar – 500ml		2

11	Measuring Jar – 1000ml	2
12	Digital Balance - 500g cap LC 0.01g	1

Computer lab		
Sl. No.	Equipment	Quantity
1	Server	1
2	Switch and Cabling	1
3	Computers with networking and Furniture	15
4	UPS	1

Software		
Sl. No.	Software Name	Quantity
1	Autodesk Fusion 360 Open-Source Education License	
2	Master CAM	5
3	CNC training /simulation software (10 user license)	1

Note:

- The Tools, Equipment, Software, and other lab facilities are shared between Qualifications and batches.
- During admission the trainees are supplied with a toolkit containing Micrometer 0- 25mm L.C. 0.01mm, Vernier Caliper 0- 150mm L.C. 0.02mm.
- Trainees are provided with Laptop.

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. White board
2. Projector with screen / Smart TV
3. Laptop / computer

Annexure 3: Industry Validations Summary

Provide 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	Mogora Cosmic (P) Ltd	Sanjay Hubli		El 31/16, Electronic Zone, Bhosari, Pune, Maharashtra – 411026	9820907828	hubli@mogora.com	
2	PMT Machines Pvt Ltd	Sonali K. Weljali		Behind PCMC, Mumbai-Pune Highway, Pimpri, Pune	7219012966	ssd@pmtmachines.com	
3	Renata Precision Components Pvt.Ltd.	Rohit Thawani		J-526, MIDC, Bhosari, Pune – 411026, India	7774086210	rohit.thawani@renata.co.in	
4	Sridevi Tool Engineers Pvt. Ltd.	Divyesh HR Department		62-D, M.G. Road, Opp. Raychem Industries, Valiv - Village, Vasai - East, Palghar - 401 208, Maharashtra, India.	8828124118 09987924808	rfq@sridevitoools.com	
5	KHK Scoffolding Ltd	Prashanth Kumar Putchala		P O Box 28480, Ducast Factory Building, Al Quoz Industrial Area 2, Dubai UAE	971-4-3411106 Ext: 107 971-582263788	khkscaf@emirates.net.ae	
6	Yanfeng India Automotive Interior Systems Pvt. Ltd.	Subodh Deshmukh		Plot No. G-1, Chakan MIDC Phase -III, Village: Nighoje Taluka Khed, Dist: Pune, Maharashtra– 410501	9822721116	yfi.info@yfai.com	https://www.linkedin.com/company/yanfeng-global/
7	Bharat Automotive Pressings Ind Pvt Ltd	Shabbir		W-148/149, 'S' Block, MIDC, Bhosari, Pune - 411 026. India	7620267852		dsmahajan@bapipl.com
8	Larsen & Toubro Limited	Chaitanya		Ahmedabad. 501, Sakar Complex I, Ashram Road Ahmedabad Pin - 380 009. Tel: 079-4900 4000. Fax: 079-2658 0491.	9623122445	Nehal.Shah@Larsentoubro.Com	
9	Shaily Engineering Plastics Ltd	Shagun Rai		Survey No.363 & 364 & 366, Rania, Ta. -Savli, Baroda, Gujarat, India- 391 780	9974093907	careers@shaily.com	
10	Heitkamp Und Thumann	Serene Ang		27 Senoko South Road	65-6871-4406	info@ht-group.com	

	(S) Pte Ltd			Woodlands East Industrial Estate, Singapore 758082	65-9631-7795		
11	Amritha Tools Craft	Sridhar Reddy		203/9, Phase II, IDA, Cherlapally, Hyderabad, Telangana 500051	9963976174	ksrinivas@amrithatoolcrafts.com	
12	Siemens Ltd	Sadiq Anwer		Aurangabad	02403985227 09689969996	sapatc.in@siemens.com	
13	Kirloskar Brothers Ltd	Mr.Ramesh Bijapur		Wadi	7447472727	hr@kbl.co.in	
14	Cears Dies & Moulds Pvt. Ltd.	Harikesh		Cears Dies & Moulds Pvt Ltd. F14, Satpur MIDC, Nasik (Maharashtra) India 422007	91-253-6614-554 Mob:9011093644	ajay@cears.co.in	
15	Molex (India) Pvt. Ltd	Pallavi Ranganath		6a, Sadaramangala Industrial Area, Kadugodi, Bengaluru, Karnataka, 560067	080 - 41293503	pallavi.ranganath@molex.com	
16	Achintyo Engineering Llp	Manjunath Kalburgi		#2331/B, 1st Floor, Rohan Plaza, 17 Th Cross, HSR Layout-1st Sector, Bengaluru, 560102	(0)80 2258 2821	mail@achintyo.com	https://www.linkedin.com/company/achintyo/
17	Whirlpool Of India Ltd	Mahendra D Jadhav		Plot#A4, Ranjangoan, MIDC, Maharashtra 412220	9028031731		https://www.linkedin.com/company/whirlpool-of-i-limited/
18	Siemens Ltd	Parag Shewale		Verna Industrial Estate, Verna, Goa 403722	9601275119		https://www.linkedin.com/in/paragshewale/
19	ARaymond Fastners India Pvt. Ltd	Sujay Jadhav		A Raymond Fasteners India Pvt. Ltd Address: Gat No. 259, 276/8b, Nighoje-Chakan, Taluka-Khed, Pune- 410501	9922991974 (SJ) Tel : +91 (2135) 676 214	sujay@araymond.com	https://www.linkedin.com/company/a-raymond-fasteners-india-private-limited
20	TTB Tooling	Kirit chheda		Plot No 63, Chimbali Phata Road, Chimbali, Khed, Pune, Maharashtra 412105	9930702054	admin@ttbtooling.com	https://www.linkedin.com/in/kirit-chheda-12a77142/
21	Bector Automation Rml India Pvt. Ltd.	Amol Chougule		Plot No 24, Gat No 613-1, Talkhed, Kurala Maharashtra 410501	7506506098	careers@rmlnz.com	https://www.linkedin.com/company/bector-automation-rml-india-private-limited/

22	Aisin Automotive Karnataka Pvt Ltd	Vijay S		Achatnahalli, Karnataka 563103	9900087705	iranna.n@aisin-akl.co.in	https://www.linkedin.com/company/aisin-automotive-karnataka-private-limited/
23	Galva Deco Parts Pvt Ltd	Bal Krishna Shrivastava		MIDC Sector 7, Industrial Area, No153 Plot Pcntda, MIDC Rd, Bhosari, Pimpri-Chinchwad, Maharashtra 411026	9168007336		
24	Dhoot Transmission Pvt Ltd	Vinayak		Gat No 312, Nanekarwadi, Chakan Maharashtra 410501	9022478398	corporatehr1@dhoottransmission.com	https://www.linkedin.com/company/dhoot-transmission-p-ltd/
25	SMP Engineers & Electricals Pvt. Ltd.	Swati Gangurde		Nandni Nagar, MIDC, Ambad, Nasik, Maharashtra 422010	7030917846	swati.gangurde@divineindia.co.in	https://www.linkedin.com/company/smp-engineers-and-electricals-private-limited/
26	Minda Industries Ltd	Tushar Verma		B6, MIDC, Chakkan Industrial Area, Talegaon-Chakan Road, Mahalunge, Ingale, Maharashtra 410501	0124-2290427		
27	Vasantha Tool Crafts Pvt Ltd	K. Sunil kumar		7-24/2, Pipeline Road, Subhash Nagar, Jeedimetla, Hyderabad, Telangana 500055	9959971307	Sunilkumar@vasantha.com	https://www.linkedin.com/in/sunil-kumar-talari-328b59a8/
28	Amphenol Interconnect India Pvt. Ltd	Divakar Kulkarni		105, Bhosari Industrial Area, Landewadi, Bhosari, Pune 411026	020 67360304	vbhavsar@amphenol-in.com	https://www.linkedin.com/company/amphenol-interconnect-india-private-limited
29	KSPG Automotive India Private Limited	Shrikant Bongale		Takawe B K, Maharashtra 412106	9552667100		https://www.linkedin.com/in/shrikant-bongale-43644898/
30	Amod Industries	Mahendra Deshmukh		L-215/1, Nimblak Road, MIDC, Ahmednagar, Maharashtra 414111	8390900870	Amod.industries@gmail.com	https://www.linkedin.com/company/amod-group-of-industries/
31	Samvardhana Motherson Reydell Companies	Dinesh Pawale		283-2, Phase 1, Hinjewadi, Rajiv Gandhi Inoteck Park,	020 66534720	dineshp@smrc-automotive.com	https://www.linkedin.com/company/samvardh

				Hinjewadi, Pune 411057			ana-motherson-reydel-companies/
32	SKH Sheet Metals Components Pvt. Ltd	Mani Awasthi		Gatno.542/545, Behind Bombay Dyeing, Ranjangaon, Maharashtra 412220	9607034533	skhsmc@skhgroup.co.in	https://www.linkedin.com/company/skh-sheet-metal-componant
33	Devu Tools.Pvt.Ltd	Praveena		Sakinaka, Mumbai 400072	9820556950		
34	Goa Sintered Products Pvt Ltd	Anil Lotlikar		Mugali, St Joes De Areal, Salcet, Goa	098229 80402	accounts@goasintered.com	https://www.linkedin.com/in/rahul-lotlikar-92b92323/
35	Satyam Venture Engg Services Pvt Ltd	Pavan Kumar Kaja		1-8-301-306, Ashoka My Home Chamber, S P ROAD, Sindhi Colony, Begumpet, Secunderabad, 500030	9985328222	pavankumar_kaja@satven.com	https://www.linkedin.com/company/satyam-venture-engineering-services/
36	Easi Technologies Pvt Ltd	Sridhar S		Salarpuria Areana,24, 6th, Hosur Rd, Bengaluru 560030	98455063106	sridhars@allegisindia.com	https://www.linkedin.com/company/easi_2/
37	Mahindra Cie Automotive Ltd - Bill Forge Division	Reginald Jacob		Gat 856-860, Chakan-Ambethan Rd, Khed Taluka, 410501	91-80-27826991-97		
38	Magna Automotive India Pvt. Ltd	Suyog Chhatre		Chakan, Maharashtra 410501	9145286093		
39	Nypun tooling and press components private limited	Sethumadhavan G Nair		194, Sector 10 Sector 17/19, MIDC, Bhosari, Pimpri Chinchwad, Maharashtra 411026		sethumadhavannr90@gmail.com	
40	Varroc Engineering Ltd	Mr Jaydip		R6P2, HCF, MIDC, Waluj, Aurangabad, Maharashtra 431133	9717288691		
41	Gestamp Automotive India	Shweta Karekar		Gate 374, 517-521 & 523, Takawe Bk, Maharashtra 412106	9673330972	krathod@in.gestamp.com	https://www.linkedin.com/company/gestamp/
42	All Time Plastics Private Limited	Girish C.V.		B-30, Royal Industrial, Estate, Rd No 26, Wadala, Mumbai, Maharashtra 400031	7573025459		
43	Dyna K Automotive Stampings Pvt Ltd	Ravindra Jadhav		J6 MIDC, Indrayani Nagar Rd, Balaji Nagar, Pimpri	8888833976	contact@dynakstamp.com	https://www.linkedin.com/company/dyna-k-

				Chinchwad, Maharashtra 411026			automotive-stampings/
44	PSR Tooling	RAJESH		10/01/0386, Bhosari Telco Rd, MIDC, Bhosari, Pimpri Chinchwad, Maharashtra 411026	9026478368	rajesh@psrtaspl.com	https://www.linkedin.com/jobs/view/tools-design-engineer-at-psr-toolings-stamping-pvt-ltd-3399742658/
45	Toyota Industries Engine India	Brijendra Shah		Plot No 9, Jigani Industrial Area Phase I, Jigani, Bengaluru 560105	9538997508	tiei@tiei.toyota-industries.com	
46	Yanfeng India Automotive Interior Systems Pvt. Ltd.	Subodh Deshmukh		Plot No. G-1, MIDC, Pimpri Colony, Pimpri Chinchwad, Maharashtra 411018	9822721116	yfi.info@yfai.com	https://www.linkedin.com/company/yanfeng-global/
47	Makino	Sudhakar		No 11, Whitefield Main Road, EPIP Zone, Whitefield, Bengaluru 560066	9972524113	mttc@makino.com.sg	https://www.linkedin.com/in/mttc-sudhakar-b3291429

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	1000	More than 10000	300	More than 2000	-	
2024	1200	More than 10000	360	More than 2000	-	
2025	1400	More than 10000	420	More than 2000	-	

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
Tool Engineering and Digital Manufacturing	2017- 2020	1046	917	896	896	8	8	8	8	NIL			
	2018 - 2021	863	811	804	804	11	11	11	11				
	2019 - 2022	875	807	799	799	5	5	5	5				

*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:**1st year of 3 years Full Time diploma Programme**Content availability for previous versions of 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:

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	90:10
2	Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	Physical classroom, Workshops, Mock sessions, Case study, Role play, Group Discussions, LMS	95:05
3	Showing Practical Demonstrations to the learners	Workshop / Lab, Video recording, Simulators	70:30
4	Imparting Practical Hands-on Skills/ Lab Work/ Workshop/ Shop floor training	Workshop machines, Lab equipment, Simulators, Mini projects, Project	90:10
5	Tutorials/ Assignments/ Drill/ Practice	Class assignments, LMS assignments, Simulators	70:30
6	Proctored Monitoring/ Assessment/ Evaluation/ Examinations	Physical classroom, Labs, Workshop, Quiz tests, Project	75:25
7	On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	Industry	100:00

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 – 1	Parts of Speech-Form meaningful Sentences	10			
	Verb Tenses-Use of right verb and tenses	10			7.5
	Language and Skill Development Exercises –Exercises on writing sentences	10			
	Writing Skills-Writing letters & reports	20			
	Sentences-Forming right sentences	17.5			10
	Language Skill Development-Oral communication skills				20
	Total Marks	100			
Mathematics – 1	Fundamentals of Mathematics-Solving arithmetical problems	20			
	Matrices and Determinants-Solving Problems	20			
	Complex Numbers -Understanding Complex Numbers	10			
	Trigonometry-Application in Engineering	20			
	Differential Calculus-Fundamentals	15			
	Statistics-Application in Engineering	15			
	Total Marks	100			
Applied Science	Physical World-Physical quantities & units	10			
	Force, Motion and Energy –Definition & units	10			
	Composition and Resolution of Forces-Resolving Forces	8			
	Friction-Definition, Application in Engineering	8			
	Equilibrium of Forces-Determining equilibrium of forces	8			
	Centre of Gravity and Moment of Inertia-Determining for different objects	12			
	Properties of Solids and Fluids- Properties of Solids and Fluids-	12			

	Heat-Definition, Unit	12			
	Industrial Chemistry-Introduction to pollution, Corrosion	12			
	Renewable Energy-Introduction to wind and solar energy	8			
	Total Marks	100			
Metrology – 1	Introduction to Metrology-Application of Metrology in Industry	10			
	Linear measurements-Measuring instruments used for linear measurement	25			
	Dial indicators -Types & Applications	15			
	Bore measuring instruments- Types & Applications	15			
	Gauges -Types & Applications	20			
	Slip Gauge-Use of slip gauges in precision measuring inspection	15			
	Total Marks	100			
Production Technology - 1	Safety-Workshop Safety & Machine Safety	10			
	Manual metal working-Filing, Marking ,Hacksawing	25			
	Metal cutting theory-Theory of Oblique and orthogonal cutting applications	10			
	Drilling-Drilling Machine, Drilling Operations, Work holding and Tool Holding Devices	15			
	Counter-boring, Countersinking, Reaming and Tapping-Definitions of operations, Specification and selection of tools	15			
	Lathe-Types, Turning Operations ,RPM Calculation by Tool Holding & Work holding Devices	25			
	Total Marks	100			
Employability Skill	Employability skills-Importance & applicability	20			5
	Behavior skills-Positive Attitude and Good Team work	20			5
	Constitutional Values & Citizenship-Awareness of our constitutional values	35			15
	Total Marks	100			
Basics of Computer Lab - 1	Computer fundamentals - Hardware and Software-Parts and functions of Computer		15		20
	Application of Office automation tools –Application of MS Word, MS Excel & Power point		65		

	Total Marks	100			
CAD Fusion 360 Lab - 1	Introduction to Autodesk Fusion360 software-Commands of Fusion 360		15		10
	Sketch and dimensioning-Creating Drawings & Dimensioning		20		10
	Introduction to Solid Modelling-Creating Solid Models using Software		25		
	Introduction to Orthographic views-Creating Orthographic views using software		20		
	Total Marks	100			
Applied Science Lab	Verification of Newton's third law of motion		10		5
	Parallelogram law: Find weight of a given body		10		
	Triangle law of forces: Find weight of a given body		10		5
	Verify polygon law of forces using force table		10		
	To measure torques on a rigid body		10		
	Determination of acceleration due to gravity by using Simple pendulum		5		
	Determination of spring constant of the given helical spring		5		
	Compare viscosity of two fluids using flow cup viscometer		10		5
	Experiments to understand surface tension		10		5
	Total Marks	100			
Engineering Drawing Lab - 1	Introduction about Engineering drawing-Application of Engineering Drawing		15		5
	Basics of Engineering drawing-Fundamental Aspects of Engineering Drawing		10		
	Geometric construction –Construction of geometric Shapes		10		
	Projection-First angle and Third angle Projection		45		5
	Dimensioning-Dimensioning of Drawings		20		
	Total Marks	100			
Workshop Practical - 1	Filing, Hacksawing, Number and Letter punching, Drilling and Reaming, Tapping, Precision Fitting, Measuring and Inspection		60		15
	Turning-Performing different Turning Operations		10		3

	Milling-Performing Different Milling Operations		10		2
	Total Marks	100			
Semester -2					
English - 2	Internal correspondence-preparing Memo, Notices & Circulars	10			
	Technical writing -Preparing Technical Reports	8			7.5
	Organizational correspondence-Preparing Minutes of Meeting & Agenda	10			
	Writing skill (activity based)-Writing Simple Essays	12			
	Communication and Public speaking skills-Preparing Simple Speech	12.5			15
	Interview skills-Interview Techniques	15			15
	Total Marks	100			
Mathematics - 2	Percentage, Ratios and Proportions-Application in Engineering	10			
	Permutation and Combination- Application in Engineering	15			
	Analytical Geometry-Introduction & Application in Engineering	25			
	3D Shapes-Introduction to 3D Shapes	15			
	Integral Calculus-Basics of calculus	20			
	Statistics- Statistics for analyzing Data	15			
	Total Marks	100			
Metrology - 2	Limits, Fits and Engineering tolerances-Application in Production	45			
	Taper and angular measurement and Measuring tools-Types & Applications	20			
	Comparators- Types & Applications	20			
	Measuring machines -Types & Applications	15			
	Total Marks	100			
Production Technology - 2	Lathe-Types of Lathe and operations	25			
	Cutting tool material-Types, Properties ,Applications	5			
	Cutting fluids and Lubricants- Types, Specification, Applications	10			
	Milling -1-Types of milling machines and operations	25			

	Grinding-Types of Grinding Machines and operations	15			
	Basic Health and Safety -Work safety, Health & Hygiene	10			
	Working Effectively with others at work-Team Work	5			
	Permanent fastening methods-Welding Operations	5			
	Total Marks	100			
Basic Electronics	Electrical safety and Hand Tools-Safety, Types of Hand Tools, Specification & Applications	6			
	Electronic materials and components-Active and Passive electronic components	12			
	Cables and wires-Types ,Specification & Applications	8			
	Measuring instruments-Types of electrical measuring instruments, Specification and applications	8			
	DC and AC Circuits-Fundamentals of AC & DC circuits	12			
	Electrical Protective Devices-Fuses,MCB,ELCB ,Specification & Applications	12			
	Display devices-LED,LCD Specification and Applications	4			
	Sensors –Types, Specification & Applications,	8			
	AC machines- Types of AC Motors, Working Principle, Specification & Applications	20			
	DC generators, DC motors-Working Principle & Applications	10			
	Total Marks	100			
Material Technology	Scope of Material technology-	10			
	Properties of material-Mechanical, Physical & Electrical Properties of Engineering Materials	10			
	Ferrous metals -Types of ferrous metals ,Properties & Applications	10			
	Influence of elements on the properties of steel	5			
	Alloy Steel -Types of alloy steels ,Properties, Specification and Applications	5			
	Materials used for manufacturing cutting tools, their properties and application	10			
	Materials used in tooling –Types, Specifications	15			

	Nonferrous metals and alloys-Types of non-ferrous metals and their alloys and applications	15			
	Testing of material-Hardness Testing, Destructive and non-Destructive Testing	15			
	Latest development in material -Explanation of Powder metallurgy, Composite Materials & Applications	5			
	Total Marks	100			
Employability Skill	Effective learning skills	20			5
	English skills-Writing Skills	20			5
	Communication skills-Effective Oral & Written Communication	35			15
	Total Marks	100			
CAD Fusion 360 Lab - 2	Sketch and Constraints-Practice on Sketching		10		5
	3D modeling using the given isometric views-Preparing 3D Models		15		
	Create 3D models using the given orthographic views		15		
	Find out third view and missing lines		10		5
	Drafting Exercises-Preparing drawing using Fusion 360		15		
	Introduction to assembly Modeling-Preparing assembly Drawing using Fusion 360		10		5
	Model Examination-Time Bound Task on use of Fusion 360		5		5
	Total Marks	100			
Engineering Drawing Lab - 2	Dimensions and Tolerances-Indicating & Interpreting		15		5
	Sectioning-Exercises in sectioning		30		5
	Surface texture -Indicating & Interpreting Surface texture		5		5
	Screws, Fasteners-Types ,Representation in Drawing		10		
	Geometrical Tolerance-Applications of Geometrical Tolerance		10		5
	Assembly and detailed drawing-Preparing Assembly and detailed drawing		20		
	Total Marks	100			
Workshop Practical - 2	Precision Fits-Execution of Precision Fits		25		5

	Manufacturing of Blanking Tool- Operations: Bench Work, Turning, Milling, Surface Grinding, Cylindrical Grinding, CNC Machining, Inspection and Assembly		55		15
	Total Marks		100		
OJT	OJT - On the Job Training in the Industry		75		25
	Total Marks		100		

Annexure 7: Assessment Strategy

1. ASSESSMENT STRATEGY

The Criteria for assessment is based on Modules, and. 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 & 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 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 & 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 by Examiners under the overall supervision of the Assessment and Evaluation Dept.

Evaluation of Theory and Practical examination is carried out by the Trained Assessors (NTTF faculty members) under the supervision of Shopfloor Manager / senior faculty 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.

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
- Tech Talk / Shop Talk
- Extracurricular and Co-curricular Activities
- Projects
- Attendance and punctuality

2. ASSESSORS

Evaluation of Theory & 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 conduct of assessments, teaching methodology etc.

3. ELIGIBILITY TO APPEAR FOR THE EXAM

- The candidates should have an attendance of a minimum 90% 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 customer needs and requirements and perform Soft Skills effectively:
 - Videos/photos of Trainees during OJT
 - Suggestions / Kaizens from trainees
 - Rewards and appreciation to trainees as applicable
3. Assessment will ensure the following:
 - 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 & Summative assessment.

- EDUSQUARE : NTTF ERP/CRM used for academic purpose EDUSQUARE erp.nttftrg.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 as and when the need arises.

List of ICT Tools:

Desktop and laptops

Interactive White Board

CCTV Camera

Pen Drive

Video Conferencing

Biometric

Edusquares: NTTF ERP/CRM used for academic purpose Edusquare erp.nttftrg.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.nttftrg.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 - 1	Module Code: CP01101T
Sl. No.	Module Details		Theory Hours 60
1	Parts of Speech		20h
2	Verb Tenses		8h
3	Language and Skill Development Exercises		15h
4	Writing Skills		4h
5	Sentences		4h
6	Language Skill Development		9h

Semester - 1		Module Name: Mathematics - 1	Module Code: CP01102T
Sl. No.	Module Details		Theory Hours 60
1	Fundamentals of Mathematics		6h
2	Matrices and Determinants		11h
3	Complex Numbers		9h
4	Trigonometry		14h
5	Differential Calculus		12h
6	Statistics		8h

Semester - 1		Module Name: Applied Science	Module Code: CP01103T
Sl. No.	Module Details		Theory Hours 40
1	Physical World		2h
2	Force, Motion and Energy		6h
3	Composition and Resolution of Forces		3h
4	Friction		3h

5	Equilibrium of Forces	5h
6	Centre of Gravity and Moment of Inertia	5h
7	Properties of Solids and Fluids	4h
8	Heat	4h
9	Industrial Chemistry	4h
10	Renewable Energy	4h

Semester - 1		Module Name: Metrology - 1	Module Code: CP01104T
Sl. No.	Module Details	Theory Hours 20	
1	Introduction to Metrology	3h	
2	Linear measurements	7h	
3	Dial indicators	2h	
4	Bore measuring instruments	2h	
5	Gauges	4h	
6	Slip Gauge	2h	

Semester - 1		Module Name: Production Technology - 1	Module Code: CP01105T
Sl. No.	Module Details	Theory Hours 30	
1	Safety	2h	
2	Manual metal working	8h	
3	Metal cutting theory	2h	
4	Drilling	4h	
5	Counter-boring, Countersinking, Reaming and Tapping	6h	
6	Lathe	8h	

Semester - 1	Module Name: Basics of Computer Lab	Module Code: CP01106P
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Sl. No.	Module Details	Practical Hours 20
1	Computer fundamentals - Hardware and Software	5h
2	Application of Office automation tools	15h

Semester - 1		Module Name: CAD- Fusion 360 Lab - 1	Module Code: CP01107P
Sl. No.	Module Details	Practical Hours 20	
1	Introduction to Autodesk Fusion360 software	4h	
2	Sketch and dimensioning	5h	
3	Introduction to Solid Modelling	7h	
4	Introduction to Orthographic views	4h	

Semester - 1		Module Name: Applied Science Lab	Module Code: CP01103P
Sl. No.	Module Details	Practical Hours 20	
1	Verification of Newton's third law of motion	2h	
2	Parallelogram law: Find weight of a given body	3h	
3	Triangle law of forces: Find weight of a given body	2h	
4	Verify polygon law of forces using force table	2.5h	
5	To measure torques on a rigid body	2.5h	
6	Determination of acceleration due to gravity by using Simple pendulum	2h	
7	Determination of spring constant of the given helical spring	2h	
8	Compare viscosity of two fluids using flow cup viscometer	2h	
9	Experiments to understand surface tension	2h	

Semester - 1		Module Name: Engineering Drawing Lab - 1	Module Code: CP01108P
Sl. No.	Module Details	Practical Hours 60	

1	Introduction about Engineering drawing	2h
2	Basics of Engineering drawing	10h
3	Geometric construction	6h
4	Projection	34h
5	Dimensioning	8h

Semester - 1 Module Name: Workshop Practical - 1 Module Code: CP01109P		
Sl. No.	Module Details	Practical Hours 240
1	Filing, Hacksawing, Number and Letter punching, Drilling and Reaming, Tapping, Precision Fitting, Measuring and Inspection	224h
2	Turning	8h
3	Milling	8h

Semester - 1 Module Name: Employability Skills Module Code: CP01110T		
Sl. No.	Module Details	Theory Hours 30
1	Employability skills-Importance & applicability	4h
2	Behavior skills-Positive Attitude and Good Team work	12h
3	Constitutional Values & Citizenship-Awareness of our constitutional values	14h

Semester - 2 Module Name: English - 2 Module Code: CP01201T		
Sl. No.	Module Details	Theory Hours 40
1	Internal correspondence	5h
2	Technical writing	4h
3	Organizational correspondence	4h
4	Writing skill (activity based)	8h
5	Communication and Public speaking skills	7h

6	Interview skills	12h
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Semester - 2		Module Name: Mathematics - 2	Module Code: CP01202T
Sl. No.	Module Details	Theory Hours 40	
1	Percentage, Ratios and Proportions	3h	
2	Permutation and Combination	6h	
3	Analytical Geometry	12h	
4	3D Shapes	5h	
5	Integral Calculus	8h	
6	Statistics	6h	

Semester - 2		Module Name: Metrology - 2	Module Code: CP01207T
Sl. No.	Module Details	Theory Hours 20	
1	Limits, Fits and Engineering tolerances	7h	
2	Taper and angular measurement and Measuring tools	5h	
3	Comparators	4h	
4	Measuring machines	4h	

Semester - 2		Module Name: Production Technology - 2	Module Code: CP01206T
Sl. No.	Module Details	Theory Hours 30	
1	Lathe	6h	
2	Cutting tool material	3h	
3	Cutting fluids and Lubricants	2h	
4	Milling -1	6h	
5	Grinding	4h	

6	Basic Health and Safety	2h
7	Working Effectively with others at work	4h
8	Permanent fastening methods	3h

Semester - 2		Module Name: Basic Electrical and Electronics	Module Code: CP01209T
Sl. No.	Module Details	Theory Hours 40	
1	Electrical safety and Hand Tools	2h	
2	Electronic materials and components	6h	
3	Cables and wires	3h	
4	Measuring instruments	3h	
5	DC and AC Circuits	6h	
6	Electrical Protective Devices	5h	
7	Display devices	1h	
8	Sensors	2h	
9	AC machines	7h	
10	DC generators, DC motors	5h	

Semester - 2		Module Name: Material Technology	Module Code: CP01208T
Sl. No.	Module Details	Theory Hours 40	
1	Scope of Material technology	4h	
2	Properties of material	3h	
3	Ferrous metals	5h	
4	Influence of elements on the properties of steel	2h	
5	Alloy Steel	3h	
6	Materials used for manufacturing cutting tools, their properties and application	4h	

7	Materials used in tooling	6h
8	Nonferrous metals and alloys	5h
9	Testing of material	6h
10	Latest development in material	2h

Semester - 2 Module Name: CAD- Fusion 360 Lab - 2 Module Code: CP01205P		
Sl. No.	Module Details	Practical Hours 45
1	Sketch and Constraints	6h
2	3D modeling using the given isometric views	9h
3	Create 3D models using the given orthographic views	7.5h
4	Find out third view and missing lines	6h
5	Drafting Exercises	9h
6	Introduction to assembly Modeling	6h
7	Model Examination	1.5h

Semester - 2 Module Name: Engineering Drawing Lab - 2 Module Code: CP01204P		
Sl. No.	Module Details	Practical Hours 60
1	Dimensions and Tolerances	6h
2	Sectioning	24h
3	Surface texture	3h
4	Screws, Fasteners	6h
5	Geometrical Tolerance	6h
6	Assembly and detailed drawing	15h

Semester - 2	Module Name: Workshop Practical - 2	Module Code: CP01222P
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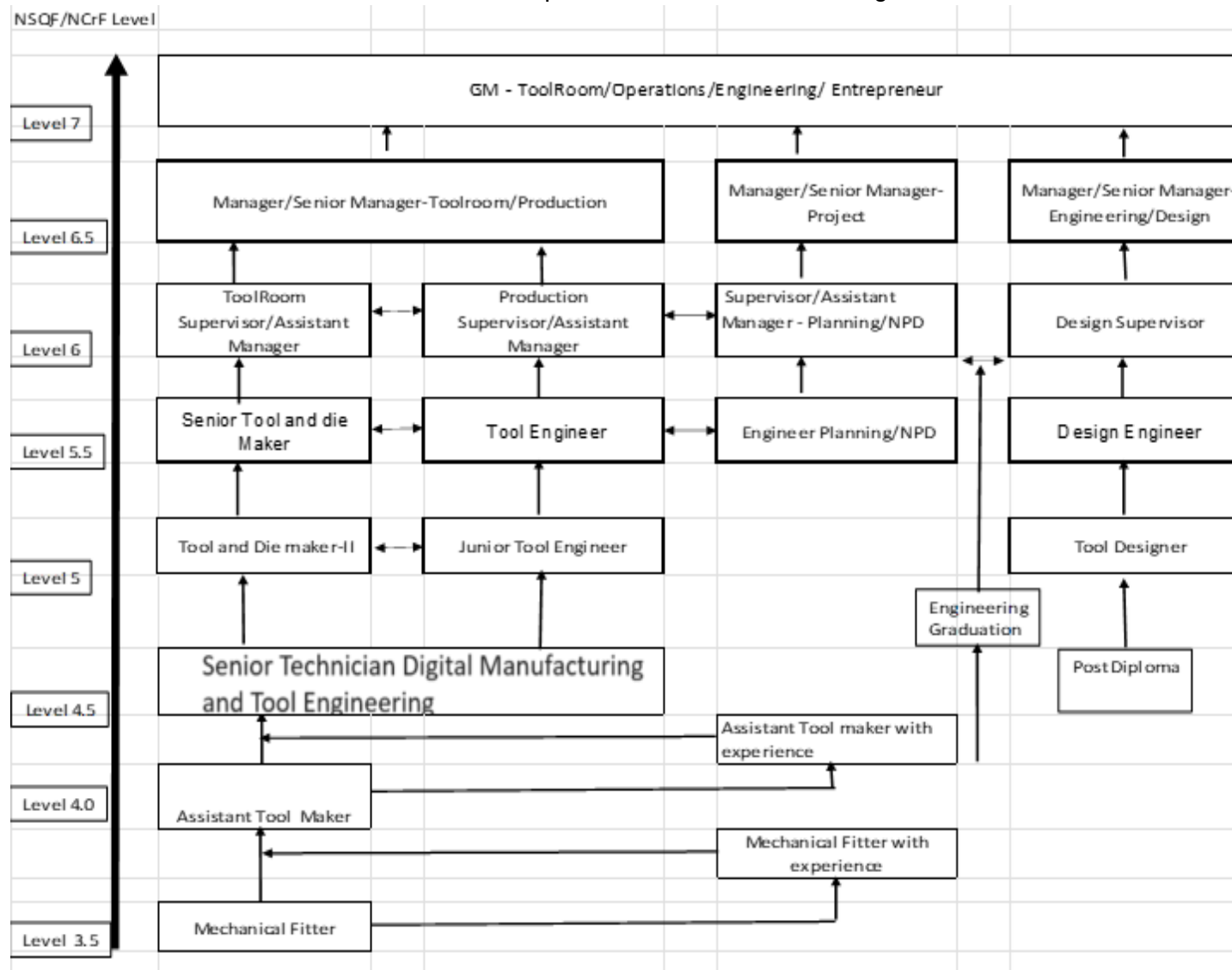
Sl. No.	Module Details	Practical Hours 165
1	Precision Fits	37h
2	Manufacturing of Blanking Tool- Operations: Bench Work, Turning, Milling, Surface Grinding, Cylindrical Grinding, CNC Machining, Inspection and Assembly	128h

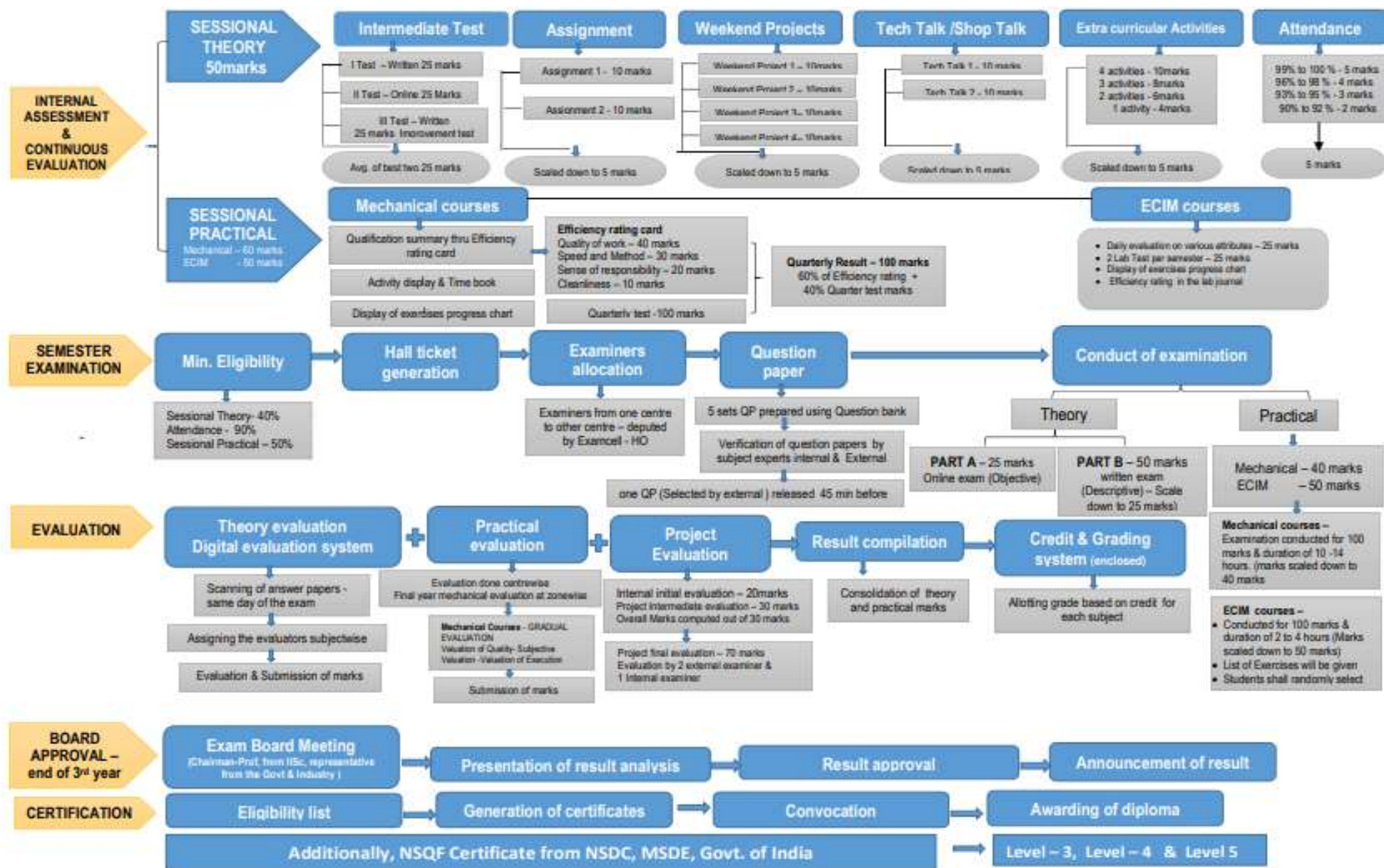
Semester - 2		Module Name: Employability Skills	Module Code: CP01223T
Sl. No.	Module Details	Theory Hours 30	
1	Effective learning skills	7h	
2	English skills-Writing Skills	8h	
3	Communication skills-Effective Oral & Written Communication	15h	

Semester - 2		Module Name: OJT	Module Code: CP01224P
Sl. No.	Module Details	Practical Hours 90	
1	OJT - On the Job Training in the Industry	90h	

Annexure 9: Career Progression**Job Roles Progression Path**

Sector: Capital Goods and Manufacturing



Annexure 10: Assessment SOP

Annexure 11: Occupational Map
Sector Name: Capital Goods and Manufacturing

As per NCrf		As per NCO-2015	Sub-Sector 1/Automotive, Aerospace, Home appliances, Textile, Construction machinery	
NCrf Level (1-8)	Level Descriptors	NCO-15 -- Family (First 4 digits code/s for the given level cross cutting the OM Sub-Sectors/Occupations)	Occupation 1/ Die and Mould, Fixture Manufacturing	Occupation 2/ Die and Mould, Fixture design
Level 8	1. Professional Theoretical Knowledge: Mastery of knowledge / Innovation driven/ Comprehensive knowledge 2. Professional and Technical Skills/ Expertise: Most advanced Technical and Managerial skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Significant authority, transformational leadership, Social intelligence 4. Broad Learning Outcomes: Lead large transformational projects 5. Responsibility: Business Vision Chairperson/ Board Member / CMD			
Level 7	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 – ToolRoom /Operations Entrepreneur	GM - Engineering/Design 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	1324 2144	Manager/Senior Manager- Toolroom/Production/Projects Electives - Metal stamping, Plastic moulding, Die casting, Fixtures, Assembly line. Options - (Automotive) (Electrical) (Aerospace) (Consumer durables)(Education Institution)	Manager/Senior Manager- Engineering/Design Electives - Metal stamping, Plastic moulding, Die casting, Fixtures, Assembly line. Options - (Automotive) (Electrical) (Aerospace) (Consumer durables)(Education Institution)
Level 6	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 7223 3122	Supervisor/Assistant Manager- Tool room /Production /Projects Electives - Metal stamping, Plastic moulding, Die casting, Fixtures, Assembly line. Options - (Automotive) (Electrical) (Aerospace) (Consumer durables)(Education Institution)	Design Supervisor Electives - Metal stamping, Plastic moulding, Die casting, Fixtures, Assembly line. Options - (Automotive) (Electrical) (Aerospace) (Consumer durables)(Education Institution)
Level 5.5	1. Professional Theoretical Knowledge: Specialized knowledge 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/Tool Engineer	3115 7223	Senior Tool and die Maker/Tool Engineer/Engineer NPD Electives - Metal stamping, Plastic moulding, Die casting, Fixtures, Assembly line. Options - (Automotive) (Electrical) (Aerospace) (Consumer durables)(Education Institution)	Design Engineer Electives - Metal stamping, Plastic moulding, Die casting, Fixtures, Assembly line. Options - (Automotive) (Electrical) (Aerospace) (Consumer durables) (Education Institution)

Level 5		3115 7222	Tool and Die maker-II/Junior Tool Engineer Electives - Metal stamping, Plastic moulding, Die casting, Fixtures, Assembly line. Options - (Automotive) (Electrical) (Aerospace) (Consumer durables)(Education Institution)	Tool Designer Electives - Metal stamping, Plastic moulding, Die casting, Fixtures, Assembly line. Options - (Automotive) (Electrical) (Aerospace) (Consumer durables) (Education Institution)
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 4. Broad Learning Outcomes: Carry out Range of tasks and may provide range of solutions 5. Responsibility: Accountable/ responsible - Jr. Technician & Technician	7222	Tool and Die maker-I /Tool Technician Electives - Metal stamping, Plastic moulding, Die casting, Fixtures, Assembly line. Options - (Automotive) (Electrical) (Aerospace) (Consumer durables)(Education Institution)	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: Work in a team-Follow instructions 4. Broad Learning Outcomes: Carry out Range of tasks with minimum supervision 5. Responsibility: Follow instructions - Jr. Technician	7222	Assistant Tool maker	
Level 3.5	1. Professional Theoretical Knowledge: Range of knowledge 2. Professional and Technical Skills/ Expertise: Fitting and machining skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Work in a team-Follow instructions 4. Broad Learning Outcomes: Carry out Range of tasks with minimum supervision 5. Responsibility: Follow instructions - Fitter	7222	Mechanical Fitter	

Annexure 12: Key Learning Outcome

SL. NO.	MODULE NAME	KNOWLEDGE AND UNDERSTANDING	TECHNICAL AND PROFESSIONAL SKILLS	APPLICATION OF KNOWLEDGE AND SKILLS
1st Year				
1	English – 1 (CP01101T) English – 2 (CP01201T) Ability to communicate effectively	Understand, comprehend grammar. Formation of simple sentences.	Communicate with peers. Writing skills – Internal and Organizational correspondence, technical writing. Public Speaking.	Write Business Letters Reports as necessary in Profession. Interact, Communicate during Interviews, debates, and Group Discussion for Career Development. Develop Presentation Skills.
2	Mathematics – 1 (CP01102T) Mathematics – 2 (CP01202T) Ability to solve various mathematical problems	Basic Algebra. Linear and quadratic equations. Understanding Analytical geometry, Correlation and regressions, sequences, and series.	Use of Trigonometry, Matrices and determinants, differential, and Integral calculus for solving Technical and Engineering problems. Use appropriate units and measurements during interactions and discussions in the work area.	Apply Statistics in Interpreting Data. Graphical representation of Data. Determine Percentage, Proportions and Ratios in day-to-day life.
3	Applied Science (CP01103T) Applied Science Lab (CP01103P) Understanding various physical quantities, Conservation, and transfer of different forms of energy	Interpret Different systems of Units and convert from one unit to another. Describe the basic concepts related to force, motion, momentum and conservation of Energy. Compare the properties of Solids and Fluids. Predict how to calculate the Centre of gravity of different plane figures. Summarize the concepts of Heat and temperature. Industrial Chemistry. Appreciate the Importance of storage	Describe Physical Law governing Translatory and Rotational Motions. Application of Parallelogram law and Triangle Law to find weight of a given body. Measure torque of rigid body.	Application of Physical laws, Fluid Dynamics, concepts of Heat, and measurement, in the work area. Various energy sources, conversion, and conservation of energy. Renewable energy sources. Apply the principles and concepts of science for solving engineering problems.

		devices and use of Renewable Energy in various applications.		
4	Metrology – 1 (CP01104T) Metrology – 2 (CP01207T) Applying the prescribed method for measuring various profiles and dimensions using appropriate devices	• Explain the Importance of Metrology in Industry • Define Units and Measurement • 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 • Use dial Indicators in workshop/ inspection activities • Classify gauges according to type, purpose and design • Explain grades of slip gauges • Explain Limits, Fits and Tolerances as per BIS • Define Clearance, Interference and Transition as per BIS • Determine Upper and Lower values of Clearance, Interference and Transition as per BIS • Define Taper and Taper Elements	Perform precision Linear measurements, Angular measurements, Bore measurements Gauges, Comparators - different types of comparators. Measuring machines - Profile projector and CMM. Understanding the principles and concepts of different measurement systems, including their advantages, disadvantages, and limitations. Knowledge of the characteristics and operation of different measuring instruments and equipment, including their selection and use. Build slip gauges for required dimensions Select fits for defined purposes	Linear Measurements- Using different measuring devices and options. Can apply their knowledge and skills in metrology to perform accurate and reliable measurements, and provide high-quality metrology services to clients in various industries. Use gauges for measuring internal and external dimension, taper, thread, thread pitch, radius, clearance and profiles Use Sine bar and Sine Plate for accurate angular measurement Use Tool maker microscope for checking/measuring profiles Use Profile Projector, CMM for checking/ measuring profiles
5	Production Technology - 1 (CP01105T) Production Technology - 2 (CP01206T) Understanding the operations of various Conventional, Non-conventional and Special purpose machines	• Explain the Importance of Health and Safety • Identify and Explain PPE • Follow Safe Working Practices to prevent accidents • Explain Fire Safety • Explain types of fires and fire extinguishers to extinguish the fire • Follow good housekeeping Practices	Identify and select work holding and tool holding devices for drilling, reaming, and tapping Identify and Specify Reamers, Taps, and Dies Calculate RPM of tool/job for the given cutting speed	Will Perform on manual metal working methods and equipment, Conventional machines, Can pursue careers in manufacturing, production, engineering, and related fields, and contribute to the design, development, and production of high-quality and innovative

		• Do Basic First Aid when required in Emergencies • Follow Emergency Procedures – raising alarm, evacuation rules, Identifying assembly point etc., • Prepare accident and Incident reports • Exhibit and maintain procedures to achieve a safe working environment • Work Effectively with others • 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 common metal working hand tools • Describe metal cutting theory • Maintain Proper workplace, Bench Layout • Use hand tools to Perform metal removing/cutting operations • Do Precision fitting operations • Describe marking process • Perform marking operation on Jobs • Describe different types of spanners and screw drivers • Select and use proper spanners and screw drivers • Describe speed feed and depth of cut • Describe and Identify nomenclature of	Understanding 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, based on factors such as material properties, production volume, and quality requirements. Understand Safety and Health aspects and Ensures Compliance with Health and Safety Regulations. Identify and name parts of the Lathe Identify and select work holding and tool holding devices for Turning operations Identify Parts and Functions of the Milling machine Identify Parts and Functions of the Surface Grinder	products. Knowledge of health and safety regulations and practices relevant to manufacturing and protective measures.
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		- single point cutting tools • Describe parts and functions of the drilling machine • Perform drilling, counter boring, counter sinking, Reaming and Tapping operations • Explain Scraping Process and Scraping Tools • Inspect Scraped Surfaces • Describe Types of Lathe and Lathe Operations • Explain functions of different mechanisms in Lathe • Explain feed and depth of cut in turning operations • Do Thread Cutting Operations • Explain Taper and Taper Turning Operations • Perform Taper Turning on Lathe • Explain Different Types of Cutting Tool material and their Characteristics, Specifications and Applications • Explain Different Types of Cutting Fluids and Lubricants and their Characteristics, Specifications and Applications • Classify types of Milling machine • Specify milling machine • Explain different milling processes • Explain Grinding Operations • Classify types of Surface Grinding machine • Specify Surface Grinder		
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6	Basics of Computer (CP01106P) Creation of various documents and reports using MS Office	Perform different computer operation (Different computer operations: setting of computer, MS Office and internet operation)	Identify different parts of a computer and their functions. Installation of OS, Personalisation of PC, and other maintenance tools.	Proficiency in using Microsoft Office applications, such as Word, Excel, and PowerPoint, to create and edit documents, spreadsheets, presentations, and emails.
7	Engineering Drawing - 1 (CP01108P) Engineering Drawing - 2 (CP01204P) CAD - Fusion 360 Lab (CP01107P) CAD - Fusion 360 Lab (CP01205P) Understanding the need of engineering drawing. Ability to create Engineering drawings through CAD software	• State Importance of engineering drawing • Proficiency in geometric construction • Refer and use SP46 • Able to draw Isometric Projection • Able to draw Orthographic Projection in 1st angle and 3rd angle • Dimension Drawings as per BIS • 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 • Interpret different forms of screw threads • Draw assembly and detailed drawings • Use Autodesk Fusion 360 • Create and Save files in Fusion 360 • Create Drawings using Fusion 360 • Do Solid modelling	Describe the difference between first and third angle projection method. Explain the difference between orthographic and isometric projection. Dimensioning, Drafting, Assembly tools, Joints motion components, Animations and Animation tools.	Draw Orthographic projection, Isometric drawing, different types of sectioning and draw sectional views Draw the Two-dimensional (2D) and three dimensional (3D) diagrams as per given dimensions using Fusion 360. Perform CAD application in 2D modelling. Create the model and prepare detail drawings – Sectional views
8	Basic Electrical and Electronics (CP01209T)	• Aware of Electrical Safety Procedures. • Identify and State Specification and Applications of Electrical hand tools • Differentiate between Conductors,	Understanding the principles and fundamentals of electrical and electronic circuits, components, and systems, and how they work together.	Knowledge that enables learners to understand the principles of electricity, circuits, and electronic components.

	Understanding different laws governing Electrical Circuits, functioning of simple Electrical Machines. Understanding different Electronic Components and their applications	Semiconductors, and Insulators • Identify and Specify Resistors, Capacitors, Inductors, and their applications • Identify and Specify Diode, Transistors, IC and their applications • Identify and Specify Wires and Cables • Identify, Specify and Use measuring instruments – Ammeter, Voltmeter, Multimeter and CRO • Describe Electron Theory • Differentiate between Potential Difference and EMF • Explain Current • State Ohms law • State Kirchhoff's Law • Determine the values of Resistance in Series and Parallel • Explain different types of Earthing and Purpose • Describe Display Devices • State types and applications of sensors • Explain construction and working principle of Transformers • Explain types and application of Single-phase AC motors • Describe construction, Working, specifications, applications, and Speed control Induction motors • Describe Working principle of Servo motors • Describe Construction and Working principle of DC Generators • Describe Construction, Working principle and applications of DC Motors	Identify and specify Electrical Protective Devices Describe construction, Working, specifications, Applications and Speed Control of Induction motors Describe Working principle of Stepper and Servo motors Describe Construction, Working principle and applications of Transformers, AC motors and DC motors	Knowledge of electrical safety procedures, regulations, and best practices. Knowledge of electrical machines, such as transformers, motors, and their operating principles. Knowledge of Resistors, Capacitors, Inductors, Diode, Transistors, IC and their applications.
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9	Material Technology (CP01208T) Understanding the properties of various Materials and their use	- Classify Engineering Materials - Explain Properties of Materials - Explain Influence of Alloy Elements in the Properties of Steel - Explain Properties and Application of Materials Used for Manufacturing Cutting tools - Describe Composition Properties of Materials used in tooling - State Specification, Application and Selection criteria of Tool Steels - Explain Types, Properties and Application of Non - Ferrous metals and Alloys - Explain Various Destructive and Non-Destructive Test	Understanding of the properties, characteristics, and behaviour of various materials and their applications. Types, Properties and Application of Cast Iron, Steel, Ferrous metals and Alloys, Polymers, Composites and Ceramics	Knowledge on Properties, Specification and Application of Materials Ability to perform and interpret material testing and analysis,
10	Workshop Practical (CP01109P) Workshop Practical (CP01222P)	Describe and explain the classification, selection and use of hand tools. Follow all safety precautions prescribed for workshop operations Read and interpret the Workshop drawings.	Identify the appropriate processes to be performed from the Drawings. Filing, Hack sawing, Drilling, Counter boring, Counter sinking, Tapping and Reaming. Bench work, Milling, Turning, Surface Grinding,	Perform different operations on the assigned job to achieve defined Specifications and dimensions. Knowledge on manual metal working methods and equipment
11	Employability Skills (CP01110T) Employability Skills (CP01223T) Ability to behave appropriately. Understand Constitutional Values/ role of citizen. Ability to communicate appropriately.	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	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 peers, superiors and subordinates with empathy and care. Practice a sense of belonging in the	Follow all the skills in the work place and society to have peace and harmony with superiors and subordinates.

	Understand Diversity and Inclusion.	Inclusion in the workplace.	society leaving behind all differences due to race, ethnicity, gender, age, identity etc.	
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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