

**CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE**

Directorate General of Training (DGT)  
Government of India, Ministry of Skill Development and Entrepreneurship,  
1st and 2nd Floor, CIRTES Building  
Next to Pusa ITI, Pusa Campus  
New Delhi – 110012.

**NCVET Code**

**2022/CCM/DGT/06210**

**Name and address of submitting body:**

Directorate General of Training (DGT)  
Government of India, Ministry of Skill Development and Entrepreneurship,  
1st and 2nd Floor, CIRTES Building  
Next to Pusa ITI, Pusa Campus  
New Delhi – 110012.

**Name and contact details of individual dealing with the submission**

Name: Mrs. Sandhya Salwan

Position in the organisation: Deputy Director General

Address if different from above:

Tel number(s): 011-25802140

E-mail address: sandhya.salwan@nic.in

**List of documents submitted in support of the Qualifications File**

**1. Competency-based curriculum with following details:**

Model Curriculum to be added which will include the following:

- a. Indicative list of tools/equipment to conduct the training: Enclosed with curriculum
- b. Trainers qualification: Indicated in the curriculum
- c. Lesson Plan: All DGT curricula are designed indicating specific practical to be carried out during training along with details of trade theory. Based on this the concerned instructor prepares the Lesson Plan and demonstration plan with support of IMPs developed by NIMI,DGT.
- d. Distribution of training duration into theory/practical/OJT component: Indicated in the curriculum.

**2. Curriculum for Core Skills (Employability Skills).**

● **SUMMARY**

<b>1</b>	<b>Qualification Title</b>	<b>'FITTER'</b>
<b>2</b>	<b>Qualification Code, if any</b>	<b>DGT/1002</b>
<b>3</b>	<b>NCO code and occupation</b>	7233.0100- Fitter, General 7233.0200- Fitter, Bench
<b>4</b>	<b>Nature and purpose of the qualification (Please specify whether qualification is short term or long term)</b>	Prepare skilled Technician to undertake the job roles of Fitter and will enable the trainee to size metal parts to close tolerances, fit and assemble them using hand tools for production or repairs of machines, or other metal products.  It is a long term qualification.
<b>5</b>	<b>Body/bodies which will award the qualification</b>	Directorate General of Training (DGT).
<b>6</b>	<b>Body which will accredit providers to offer courses leading to the qualification</b>	Directorate General of Training (DGT) accredits the Training providers (ITIs/ NSTIs/ MSTIs/ BTCs/ BTPs / Industries / Establishments).
<b>7</b>	<b>Whether accreditation/affiliation norms are already in place or not, if applicable (if yes, attach a copy)</b>	Yes. The accreditation/ affiliation norms and any amendments made from time to time are available on DGT web portal.
<b>8</b>	<b>Occupation(s) to which the qualification gives access</b>	<ul style="list-style-type: none"> <li>Fitter General</li> </ul>
<b>9</b>	<b>Job description of the occupation</b>	The individual will be able to study drawings to understand specification of different parts, fittings or assemblies to be made and their functions. He/she will hold the work in Vice, Cuts and shapes required parts to dimensions and specifications by processes of sawing, chipping, filing, grinding, drilling holes, screw cutting, scrapping etc.
<b>10</b>	<b>Licensing requirements</b>	NOT REQUIRED
<b>11</b>	<b>Statutory and Regulatory requirement of the relevant sector (documentary evidence to be provided)</b>	NOT APPLICABLE

12	Level of the qualification in the NSQF	Level 4																										
13	Anticipated volume of training/learning required to complete the qualification	<table border="1"> <thead> <tr> <th rowspan="2">S No</th> <th rowspan="2">Course Element</th> <th colspan="2">Notional Training Hours</th> </tr> <tr> <th>1<sup>st</sup> Year</th> <th>2<sup>nd</sup> Year</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Professional Skill (Trade Practical)</td> <td>840</td> <td>840</td> </tr> <tr> <td>2</td> <td>Professional Knowledge (Trade Theory)</td> <td>240</td> <td>300</td> </tr> <tr> <td>3</td> <td>Employability Skills</td> <td>120</td> <td>60</td> </tr> <tr> <td colspan="2"><b>Total</b></td> <td>1200</td> <td>1200</td> </tr> <tr> <td colspan="2">On the Job Training (OJT)/ Group Project</td> <td>150</td> <td>150</td> </tr> </tbody> </table>	S No	Course Element	Notional Training Hours		1 <sup>st</sup> Year	2 <sup>nd</sup> Year	1	Professional Skill (Trade Practical)	840	840	2	Professional Knowledge (Trade Theory)	240	300	3	Employability Skills	120	60	<b>Total</b>		1200	1200	On the Job Training (OJT)/ Group Project		150	150
S No	Course Element	Notional Training Hours																										
		1 <sup>st</sup> Year	2 <sup>nd</sup> Year																									
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2	Professional Knowledge (Trade Theory)	240	300																									
3	Employability Skills	120	60																									
<b>Total</b>		1200	1200																									
On the Job Training (OJT)/ Group Project		150	150																									
14	Indicative list of training tools required to deliver this qualification	As per Annexure I of curriculum.																										
15	Entry requirements and/or recommendations and minimum age	<p>Passed 10th class examination with Science and Mathematics or with vocational subject in same sector or its equivalent.</p> <p>Minimum age 14 years as on first day of academic session.</p>																										
16	Progression from the qualification (Please show Professional and academic progression)	<p>An Individual can proceed for:</p> <table border="1"> <thead> <tr> <th>Professional</th> <th>Technical / Academic</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>• Technician</li> <li>• Senior Technician</li> <li>• Supervisor</li> <li>• Manager</li> <li>• Entrepreneur</li> </ul> </td> <td> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">             ATS CITS         </div> <div style="text-align: center;">             Diploma/ Advance Diploma (Vocational)         </div> </div> </td> </tr> </tbody> </table>	Professional	Technical / Academic	<ul style="list-style-type: none"> <li>• Technician</li> <li>• Senior Technician</li> <li>• Supervisor</li> <li>• Manager</li> <li>• Entrepreneur</li> </ul>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">             ATS CITS         </div> <div style="text-align: center;">             Diploma/ Advance Diploma (Vocational)         </div> </div>																						
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17	<b>Arrangements for the Recognition of Prior learning (RPL)</b>	<ul style="list-style-type: none"> <li>Yes (For more details refer “Guidelines for Private candidate” in DGT website MIS portal).</li> </ul>		
18	<b>International comparability where known (research evidence to be provided)</b>	-		
19	<b>Date of planned review of the qualification.</b>	3 Yrs. from the Date of Approval		
20	<b>Formal structure of the qualification</b>			
	<b>Mandatory components</b>			
	<b>Title of component and identification code/NOSs/ Learning Outcomes</b>	<b>Estimated size (learning hours)</b>		<b>Level</b>
		<b>Skills</b>	<b>Knowledge</b>	
<b>TRADE SPECIFIC</b>				
(i)	Plan and organize the work to make job as per specification applying different types of basic fitting operation and Check for dimensional accuracy following safety precautions. <i>[Basic fitting operation – Marking, Hacksawing, Chiselling, Filing, Drilling, Taping and Grinding etc. Accuracy: ± 0.25mm]</i> CSC/N0304	212	37	4
(ii)	Manufacture simple sheet metal items as per drawing and join them by soldering, brazing and riveting. CSC/N03001	97	21	4
(iii)	Join metal components by riveting observing standard procedure. CSC/N0304	19	03	4
(iv)	Join metal component by arc welding observing standard procedure. CSC/N0304	21	04	4

(v)	Cut and join metal component by gas (oxyacetylene) CSC/N0304	64	16	4
(vi)	Produce components by different operations and check accuracy using appropriate measuring instruments. [Different Operations - Drilling, Reaming, Taping, Dieing; Appropriate Measuring Instrument – Vernier, Screw Gauge, Micrometer] CSC/N0304	143	26	4
(vii)	Make different fit of components for assembling as per required tolerance observing principle of interchange ability and check for functionality. [Different Fit – Sliding, Angular, Step fit, 'T' fit, Square fit and Profile fit; Required tolerance: $\pm 0.04$ mm, angular tolerance: 30 min.] CSC/N0304	126	28	4
(viii)	Produce components involving different operations on lathe observing standard procedure and check for accuracy. [Different Operations – facing, plain turning, step turning, parting, chamfering, shoulder turn, grooving, knurling, boring, taper turning, threading (external 'V' only)] CSC/N0110	95	15	4
(ix)	Plan & perform simple repair, overhauling of different machines and check for functionality. [Different Machines – Drill Machine, Power Saw, Bench Grinder and Lathe] N/A	63	12	4
(x)	Read and apply engineering drawing for different application in the field of work.		40	4
(xi)	Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study.		38	4

(xii)	Make & assemble components of different mating surfaces as per required tolerance by different surface finishing operations using different fastening components, tools and check functionality. [Different Mating Surfaces – Dovetail fitting, Radius fitting, Combined fitting; Different surface finishing operations – Scraping, Lapping and Honing; Different fastening components – Dowel pins, screws, bolts, keys and cotters; Different fastening tools-hand operated & power tools, Required tolerance - $\pm 0.02\text{mm}$ , angular tolerance $\pm 10$ min.] CSC/N0304	255	70	4
(xiii)	Make different gauges by using standard tools & equipment and checks for specified accuracy. [Different Gauges – Snap gauge, Gap gauge; Specified Accuracy - $\pm 0.02\text{mm}$ ] CSC/N0304	113	30	4
(xiv)	Apply a range of skills to execute pipe joints, dismantle and assemble valves & fittings with pipes and test for leakages. [Range of skills – Cutting, Threading, Flaring, Bending and Joining] CSC/N0304	62	18	4
(xv)	Make drill jig & produce components on drill machine by using jigs and check for correctness. CSC/N0304	24	06	4
(xvi)	Plan, dismantle, repair and assemble different damaged mechanical components used for power transmission & check functionality. [Different Damage Mechanical Components – Pulley, Gear, Keys, Jibs and Shafts.] CSC/N0304	152	43	4
(xvii)	Identify, dismantle, replace and assemble different pneumatics and hydraulics components. [Different components – Compressor, Pressure Gauge, Filter	41	14	4

	Regulator Lubricator, Valves and Actuators.]N/A			
(xviii)	Construct circuit of pneumatics and hydraulics observing standard operating procedure& safety aspect. N/A	38	12	4
(xix)	Plan & perform basic day to day preventive maintenance, repairing and check functionality. [Simple Machines – Drill Machine, Power Saw and Lathe] CSC/N0304	80	23	4
(xx)	Plan, erect simple machine and test machine tool accuracy. [Simple Machines – Drill Machine, Power Saw and Lathe]N/A	75	16	4
(xxi)	Read and apply engineering drawing for different application in the field of work.		40	4
(xxii)	Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study.		28	4
<b>CORE SKILL</b>				
<b>EMPLOYABILITY SKILLS</b>				
(i)	Introduction to Employability Skills	-	180	-
(ii)	Constitutional values - Citizenship	-		-
(iii)	Becoming a Professional in the 21st Century	-		-
(iv)	Basic English Skills	-		-
(v)	Career Development & Goal Setting	-		-
(vi)	Communication Skills	-		-
(vii)	Diversity & Inclusion	-		-
(viii)	Financial and Legal Literacy	-		-
(ix)	Essential Digital Skills	-		-

**NSQF QUALIFICATION FILE**  
**Approved in 22th NSQC Meeting-NCVET-25<sup>th</sup> August 2022**

**Fitter**

(x)	Entrepreneurship	-		-
(xi)	Customer Service	-		-
(xii)	Getting Ready for Apprenticeship & Jobs	-		-
			2400	
	<b>On the Job Training (OJT)/ Group Project</b>		300	

NSQC Approved



**SECTION 1**  
**ASSESSMENT**

21	<p><b>Body/Bodies which will carry out assessment:</b>          Controller of Examinations, DGT</p>
22	<p>DGT will carry out the RPL assessment following the below mentioned eligibility criteria for Trainee:</p> <p>Applicants aspiring to appear as Private Candidates in the AITT under CTS for award of NTC, have been categorized based on their educational background and experience. Subsequently 'Private Candidates' may be admitted under one of the following categories. Category wise 'eligibility criteria' for appearing as 'Private Candidate' in AITT under CTS has been listed below:</p> <p>Category I: Ex-trainees (successful pass-outs) of ITI</p> <p>A. Ex-trainees of ITI who already possess NTC in one of the trades under CTS, are eligible for applying as Private candidate for an allied trade, provided he/ she fulfils all the conditions regarding educational qualification etc. prescribed for that allied trade.</p> <p>B. In addition, the applicant should possess minimum of 1 year experience (as on date of submission of application) post the date of AITT result declaration in the desired allied trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the concerned State.</p> <p>Category II: 'Ex-trainees (successful pass-outs) and current trainees under CoE scheme</p> <p>A. The applicant should have the minimum prescribed entry qualification and should fulfil eligibility criteria for the desired trade under CTS, in which he/she intends to appear for AITT as Private Candidate. CoE candidates must register as 'Private Candidate' under CTS in the relevant/mapped CTS trade only.</p> <p>B. There should be a minimum gap of 1 year between successful completions of CoE training i.e. from the date of result declaration to the date of submission of application for 'Private Candidate' certification.</p> <p>C. During this gap of 1 year, the candidate must have undergone Industry training or gained experience in desired trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under</p>

	<p>Factories Act 1948 and Shops and Establishments Act applicable for the concerned State.</p> <p>Category III: SCVT Candidates (admitted till August 2018 session)</p> <p>A. No special provisions have been made for SCVT Trainees to enrol as 'Private Candidate'. Going forward, SCVT trainees have been granted equivalence vide G.S.R 186(E) dated 2nd March 2017 for undergoing apprenticeship training under the Apprentices Act 1961 to obtain 'NAC'.</p> <p>B. Only for SCVT trainees admitted till August 2018 batch, provision has been made for obtaining NTC by appearing in AITT under 'Private Candidate'. Such trainees will continue to be governed by old guidelines for 'Private Candidate'.</p> <p>Category IV: Other Candidates (candidate not falling in any of the above 3 categories, including SCVT trainees enrolled from admission session 2019 onwards)</p> <p>A. The applicant should have the minimum prescribed entry qualification and should fulfil eligibility criteria for the relevant trade under CTS, in which he/she desires to appear for AITT as Private Candidate.</p> <p>B. Applicant should be minimum 21 years of age on the date of submission of application. There is no upper age limit.</p> <p>C. The applicant should possess minimum of 3 years' experience (on the date of submission of application) in the relevant trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the concerned State.</p> <p>For detail and updated information please refer to DGT web portal.</p>
<p><b>23</b></p>	<p><b>Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.</b></p> <p><b>(1) Assessment process:</b></p> <p>The assessment for the qualification is carried out by conducting formative assessments, and end of year examinations (Summative). The formative assessments in respect of each Learning Outcome for practical and related theory are conducted by the concerned instructors for evaluating the knowledge and skill acquired by trainees and the behavioural transformation of the trainees. This formative assessment is primarily carried out by collecting evidence of competence gained by the trainees by evaluating them</p>

at work based on assessment criteria, asking questions and initiating formative discussions to assess understanding and by evaluating records and reports. Summative assessment is carried out by All India Trade Test on Trade Theory, Trade practical, and Employability Skills. The question papers for the theory Examinations contain objective type questions.

The marking pattern and distribution of marks for the qualification are as under:

Marking Pattern				
Sl. No.	Type of Assessment	Subject for the Trade Test	Marks for the 1st Year	Marks for the 2nd Year
1	Summative Assessment	Practical	250	250
2		Trade Theory	100	100
3		Employability Skills	50	50
4	Formative assessment based on Learning Outcomes		200	200
<b>TOTAL:</b>			600	600

**(2) Minimum pass marks:**

The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%. There will be no Grace marks.

**Testing and certifications for the course:**

Controller of examinations, DGT carries out the assessment and issues National Trade Certificate (NTC) following the norms and guidelines issued by the Directorate from time to time.

**Overall assessment strategy:**

Assessment of the qualification evaluates trainees to show that they can integrate knowledge, skills and values for carrying out relevant tasks as per the defined learning outcomes and assessment criteria. The trainees may choose the preferred language for assessment. The underlying principle of assessment is fairness and transparency. While assessing the trainee, assessor is directed to assess as per the defined assessment criteria against the learning outcomes. The evidence of the competence acquired by the trainees can be obtained by conducting theory and practical examinations, observing the trainees at work, asking questions and initiating discussions to assess, understand and evaluate records and reports. The ultimate objective of the assessment is to assess the candidates as per the defined assessment criteria for the learning outcomes.

**Specific Arrangements for assessment:**

- Assessment is outcome-based.
- There are formative and summative assessments in Theory and Practical.
- Assessment is carried out in Trade theory, Trade Practical, Employability Skills.
- While Trade Theory and Trade Practical are used for assessing Trade-related jobs, numerical and logical skills, draw and read sketches and Employability skills is used to test the communication, professional language, leadership, entrepreneurship and team-work abilities of the trainee.
- In addition to demonstration of theory and practical knowledge, trainees get a chance to present total personality.

**Quality assurance activities:**

Question papers are set by external paper setters/ software generated.  
Evaluation of Theory Examinations in Trade, and Employability Skill is done by third-party agency.  
Trade Practical is examined by External Examiner.

## **24. Assessment evidences**

### **Title of Component: Formative Assessment Breakup**

( on half yearly average of the learning assessment covered)

#### **Means of assessment**

Assessment will be evidence based comprising the following for each Learning Outcome:

<b>Seria I No.</b>	<b>Terminal Competency</b>	<b>Maximum Weightage (%)</b>
1	Safety consciousness	15
2	Workplace hygiene	5
3	Attendance/ Punctuality	10
4	Ability to follow Manuals/ Written instructions	5
5	Application of Knowledge	10
6	Skills to handle tools / equipment/ Instruments/ Devices	10
7	Economical use of materials	5
8	Working Strategy	10
9	Quality in workmanship/ Performance	15
10	VIVA	15
	Total Maximum Weightage (%)	100

**Pass/Fail**

The minimum pass percentage is 60% marks for formative assessment.

LEARNING OUTCOME WITH ASSESSMENT CRITERIA:

LEARNING OUTCOME (TRADE SPECIFIC)	
LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>FIRST YEAR</b>	
<p>1. Plan and organize the work to make job as per specification applying different types of basic fitting operation and Check for dimensional accuracy following safety precautions. <i>[Basic fitting operation – marking, Hacksawing, Chiselling, Filing, Drilling, Taping and Grinding etc. Accuracy: ± 0.25mm]</i> CSC/N0304</p>	Plan & Identify tools, instruments and equipment for marking and make this available for use in a timely manner.
	Select raw material and visual inspect for defects.
	Mark as per specification applying desired mathematical calculation and observing standard procedure.
	Measure all dimensions in accordance with standard specifications and tolerances.
	Identify Hand Tools for different fitting operations and make these available for use in a timely manner.
	Prepare the job for Hacksawing, chiselling, filing, drilling, tapping, grinding.
	Perform basic fitting operations viz., Hacksawing, filing, drilling, tapping and grinding to close tolerance as per specification to make the job.
	Observe safety procedure during above operation as per standard norms and company guidelines.
	Check for dimensional accuracy as per standard procedure.
Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.	
<p>2. Manufacture simple sheet metal items as per drawing and join them by soldering, brazing and riveting. CSC/N0301</p>	Identify Hand Tools for Sheet Metal work, Soldering, Brazing & riveting and make these available for use in a timely manner.
	Mark and develop various forms as per drawing using sheet metals.
	Make of simple items with sheet metal as per drawing.
	Prepare the job for Soldering, Brazing & riveting.
	Identify different type of rivets and use as per requirement.
	Identify tools for drilling and use these tools.

	Mark according to drawing.
	Drill through holes on the job.
	Solder, Braze and Rivet to prepare a job as per given drawing / sample following standard practices.
	Observe safety procedure during riveting as per standard norms and company guidelines.
3. Join metal components by riveting observing standard procedure. CSC/N0304	Identify Tools and equipments for riveting and make these available for use in a timely manner.
	Prepare the job for lap and butt joint.
	Identify different type of rivets and use as per requirement.
	Identify tools for drilling and use these tools.
	Mark according to drawing.
	Drill through holes on the job.
	Rivet to prepare a job as per given drawing / sample following standard practices.
	Observe safety procedure during riveting as per standard norms and company guidelines.
4. Join metal component by arc welding observing standard procedure. CSC/N0304	Identify different components/parts of arc welding machine, collect desired information and set each components/parts as per standard procedure.
	Observe safety/ precaution during operation.
	Select appropriate material & plan for arc welding.
	Weld metal parts / mechanical components as per specification observing standard procedure.
	Check joined part portion to ascertain proper welding.
5. Cut and join metal component by gas (oxyacetylene). CSC/N0304	Identify different components/parts of Gas (oxyacetylene) machine, collect desired information and set each components/parts as per standard procedure.
	Observe safety/ precaution during operation.
	Select appropriate material & plan for gas cutting & joining operation.
	Cut & join metal parts / mechanical components as per specification observing standard procedure.
	Check cut portion/ joined part to ascertain proper welding.

6. Produce components by different operations and check accuracy using appropriate measuring instruments. <i>[Different Operations - Drilling, Reaming, Taping, Dieing; Appropriate Measuring Instrument – Vernier, Screw Gauge, Micrometer]</i> CSC/N0304	Ascertain and select tools and materials for the job and make this available for use in a timely manner.
	Plan work in compliance with standard safety norms.
	Produce component by observing standard procedure.
	Check the dimensions of the produced components to ensure dimensions are within prescribed limit.
	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
7. Make different fit of components for assembling as per required tolerance observing principle of interchangeability and check for functionality. <i>[Different Fit – Sliding, Angular, Step fit, 'T' fit, Square fit and Profile fit; Required tolerance: ±0.04 mm, angular tolerance: 30 min.]</i> CSC/N0304	Recognize general concept of Limits, Fits and tolerance necessary for fitting applications and functional application of these parameters.
	Ascertain and select tools and materials for the job and make this available for use in a timely manner.
	Set up workplace/ assembly location with due consideration to operational stipulation
	Plan work in compliance with standard safety norms and collecting desired information.
	Demonstrate possible solutions and agree tasks within the team.
	Make components according to the specification for different fit using a range of practical skills and ensuring interchangeability of different parts.
	Assemble components applying a range of skills to ensure proper fit.
Check functionality of components.	
8. Produce components involving different operations on lathe observing standard procedure and check for accuracy. <i>[Different Operations – facing, plain turning, step turning, parting, chamfering, shoulder</i>	Ascertain basic working principles and safety aspect of lathe machine.
	Understand functional application of different levers, stoppers, adjustment etc.
	Identify different lubrication points and lubricants, their usage for application in lathe machine as per machine manual.
	Identify different work and tool holding devices and collect information for functional application of each device.



<p><i>turn, grooving, knurling, boring, taper turning, threading (external 'V' only)] CSC/N01110</i></p>	Mount the work and tool holding devices with required alignment and check for its functional usage to perform lathe operations.
	Solve problem by applying basic methods, tools, materials and information during setting.
	Observe safety procedure during mounting as per standard norms.
	Produce components observing standard procedure.
	Check accuracy/ correctness of job using appropriate equipment/gauge.
	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
<p>9. Plan&amp;perform simple repair, <i>overhauling</i> of different machines and check for functionality. [Different Machines – Drill Machine, Power Saw, Bench Grinder and Lathe]N/A</p>	Ascertain and select tools and materials for the repair, overhauling and make this available for use in a timely manner.
	Plan work in compliance with standard safety norms.
	Demonstrate possible solutions and agree tasks within the team.
	Select specific parts to be repaired and ascertain for appropriate material and estimated time.
	Repair, overhaul and assemble the parts in the machine with the help of blueprint.
	Check for functionality of part and ascertain faults of the part/ machine in case of improper function.
	Rectify faults of assembly.
<p>10. Read and apply engineering drawing for different application in the field of work.</p>	Read & interpret the information on drawings and apply in executing practical work.
	Read & analyze the specification to ascertain the material requirement, tools and assembly/maintenance parameters.
	Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.
<p>11. Demonstrate basic mathematical concept and principles to perform</p>	Solve different mathematical problems
	Explain concept of basic science related to the field of study

<p>practical operations. Understand and explain basic science in the field of study.</p>	
<b>SECOND YEAR</b>	
<p>12. Make &amp; assemble components of different mating <i>surfaces</i> as per required tolerance by different surface finishing operations using different fastening components, tools and check functionality. [ <i>Different Mating Surfaces – Dovetail fitting, Radius fitting, Combined fitting; Different surface finishing operations – Scraping, Lapping and Honing; Different fastening components – Dowel pins, screws, bolts, keys and cotters; Different fastening tools- hand operated &amp; power tools, Required tolerance - <math>\pm 0.02\text{mm}</math>, angular tolerance <math>\pm 10</math> min.] CSC/N0304</i></p>	<p>Ascertain and select tools and materials for the job and make this available for use in a timely manner.</p> <p>Plan work in compliance with standard and collecting necessary information.</p> <p>Set up workplace/ assembly location with due consideration to operational stipulation</p> <p>Demonstrate possible solutions and agree tasks within the team.</p> <p>Produce different components with appropriate accuracy by observing standard procedure &amp; method as per specification using appropriate tools &amp; machines.</p> <p>Perform scraping and lapping of components to obtain required surface finish of different mating surface.</p> <p>Comply with safety rules when performing the above operations.</p> <p>Check tolerance and accuracy of components as defined with appropriate instruments observing standard procedure.</p> <p>Assemble different components using different fastening components, tools and check the functionality.</p>
<p>13. Make different gauges by using standard tools &amp; equipment and checks for specified accuracy. [ <i>Different Gauges – Snap gauge, Gap gauge; Specified Accuracy - <math>\pm 0.02\text{mm}</math> ] CSC/N0304</i></p>	<p>Ascertain and select tools and materials for the job and make this available for use in a timely manner.</p> <p>Plan work in compliance with standard safety norms.</p> <p>Produce gauge by observing appropriate method and as per specification of drawing.</p> <p>Perform Lapping of gauge to obtain required finish as per drawing.</p> <p>Check tolerance and specified accuracy of gauge with appropriate measuring instruments as per drawing.</p> <p>Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.</p>

14. Apply a range of skills to execute pipe joints, dismantle and assemble valves & fittings with pipes and test for leakages. <i>[Range of skills – Cutting, Threading, Flaring, Bending and Joining]</i> CSC/N0304	Ascertain and select tools and materials for the job and make this available for use in a timely manner.
	Plan to Dismantle and assemble valves and pipe fittings.
	Dismantle valves and fittings in pipes applying range of skills and check for defect as per standard procedure.
	Demonstrate possible solutions in case of defect and agree tasks within the team for repair or replacement.
	Assemble valves and various pipe fittings using range of skills and observing standard procedure.
	Test for leakage and appropriate functioning of valves.
	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
15. Make drill jig & produce components on drill machine by using jigs and check for correctness. CSC/N0304	Set up workplace/ assembly location with due consideration to operational stipulation
	Ascertain and select tools and materials for the job and make this available for use in a timely manner.
	Collect information related to standard procedure, methods and tools to make drill jigs.
	Mark the components as per drawing.
	Make drill jigs by turning, drilling, reaming, filing, tapping, etc.
	Test the functionality of jig.
	Select suitable jigs for drilling considering desired result and collecting necessary information.
	Produce component by using jig observing standard procedure and check the correctness of the job.
Comply with safety rules when performing the above operations.	
16. Plan, dismantle, repair and assemble different damaged mechanical components used for power transmission & check functionality. <i>[Different Damage Mechanical Components – Pulley, Gear, Keys, Jibs and Shafts.]</i> CSC/N0304	Select and ascertain tools and materials for the job and make this available for use in a timely manner.
	Plan to dismantle, repair and assemble mechanical components used for power transmission as per drawing and collecting necessary information.
	Perform dismantling and appropriate repairing of mechanical components with accuracy applying range of skills and appropriate repairing processes.
	Check the accuracy of the repaired components with appropriate gauge & instruments.
	Assemble the repaired mechanical components observing standard procedure.
	Comply with safety rules when performing the above operations.

	<p>Check different parameters of power transmission e.g. R.P.M, slackness of belts, matching of gears/ clutches, loss of RPM etc.</p> <p>Check for functionality of power transmission system or any assembly as per standard parameters.</p>
<p>17. Identify, dismantle, replace and assemble different pneumatics and hydraulics components. [Different components – Compressor, Pressure Gauge, Filter Regulator Lubricator, Valves and Actuators.]</p>	<p>Select and ascertain tools for the job and make this available for use in a timely manner.</p> <p>Identify different pneumatics and hydraulics components.</p> <p>Plan to dismantle and replace pneumatics &amp; hydraulics circuit as per drawing and collecting necessary information.</p> <p>Perform dismantling and replacing of different components with accuracy applying range of skills and standard operating procedure.</p> <p>Assemble different components.</p> <p>Check functionality of the components.</p>
<p>18. Construct circuit of pneumatics and hydraulics observing standard operating procedure &amp; safety aspect.</p>	<p>Select and ascertain tools for the job and make this available for use in a timely manner.</p> <p>Plan to construct pneumatics &amp; hydraulics circuit as per drawing and collecting necessary information.</p> <p>Demonstrate possible solutions and agree tasks within the team for constructing circuit.</p> <p>Construct circuit of pneumatics and hydraulics observing standard procedure.</p> <p>Comply with safety rules when performing the above operations.</p> <p>Check different parameters and functionality of the system.</p>
<p>19. Plan &amp; perform basic day to day preventive maintenance, repairing and check functionality. [Simple Machines – Drill Machine, Power Saw and Lathe] CSC/N0304</p>	<p>Ascertain preventive maintenance/repair procedure as per manual of machine and select appropriate tools &amp; equipment for undertaking job.</p> <p>Interpret construction, alignment and assembly of different parts of machine.</p> <p>Plan to carry out the preventive maintenance/repair task with appropriate accuracy of simple machine by collecting necessary information.</p> <p>Demonstrate possible solutions and agree tasks within the team.</p> <p>Perform preventive maintenance/dismantle, repair parts and assemble sub-assemblies of simple machine as per layout plan and standard procedure.</p> <p>Put the machine in operation complying Standard operating procedure.</p>

	<p>Check for proper functioning of repaired machine and other parameters of simple machine as per manual after erection.</p> <p>Dispose unsalvageable materials as per standard procedures.</p>
<p>20. Plan, erect simple machine and test machine tool accuracy.  <i>[Simple Machines – Drill Machine, Power Saw and Lathe]</i></p>	<p>Ascertain erection procedure as per manual of machine and select appropriate tools &amp; equipment for undertaking job.</p>
	<p>Interpret construction, alignment and assembly of different parts of machine.</p>
	<p>Set up workplace/ assembly location with due consideration to operational stipulation</p>
	<p>Plan to carry out the erection of simple machine by collecting necessary information.</p>
	<p>Demonstrate possible solutions and agree tasks within the team.</p>
	<p>Erect simple machine as per layout plan and standard procedure.</p>
	<p>Put the machine in operation complying Standard operating procedure.</p>
	<p>Check alignment of erected machine and other parameters of simple machine as per manual after erection.</p>
	<p>Dispose unsalvageable materials as per standard procedures.</p>
<p>21. Read and apply engineering drawing for different application in the field of work.</p>	<p>Read &amp; interpret the information on drawings and apply in executing practical work.</p>
	<p>Read &amp; analyze the specification to ascertain the material requirement, tools and assembly/maintenance parameters.</p>
	<p>Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.</p>
<p>22. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study.</p>	<p>Solve different mathematical problems</p>
	<p>Explain concept of basic science related to the field of study</p>

<b>EMPLOYABILITY SKILLS (CORE SKILL)</b>	
<b>LEARNING OUTCOME</b>	<b>ASSESSMENT CRITERIA</b>
1. Introduction to Employability Skills	Outline the importance of Employability Skills for the current job market and future of work.
	List different learning and employability related GOI and private portals and their usage.
	Research and prepare a note on different industries and the available opportunities.
2. Constitutional values - Citizenship	Explain the essential civic rights and duties required to be followed to become a responsible citizen.
	Discuss the role of personal values and ethics in personal and social development.
	Identify and practice different environmentally sustainable practices.
3. Becoming a Professional in the 21st Century	Discuss relevant 21st century skills required for employment
	Highlight the importance of practicing 21st century skills like Self-Awareness, Behavior Skills, Positive attitude, self-motivation, problem solving, and time management skills in personal or professional life
	Create a pathway for adopting a learning mindset for personal and professional development
4. Basic English Skills	Use appropriate grammar and sentences while interacting with others
	Read English text with appropriate articulation
	Role play a situation on how to talk appropriately to a customer in English, over the phone or in person
	Write a short note/paragraph / letter/e-mail using correct English
5. Career Development & Goal Setting	Research and identify trends and different skills required to match the current market requirement for a job
	Create a career development plan with well-defined short- and long-term goals
6. Communication Skills	Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette
	Write a short note/paragraph on a familiar topic

	Explain the importance of communication etiquette including active listening for effective communication
	Role play a situation on how to work collaboratively with others in a team
7. Diversity and Inclusion	Exhibit how to behave, communicate and conduct oneself appropriately with all genders and PwD
	Discuss the POSH Act and its significance
8. Financial and Legal Literacy	Discuss various financial institutions, products, and services
	Demonstrate how to carry out offline and online financial transactions, safely and securely and check passbook/statement
	Explain the common components of salary such as Basic, PF, Allowances (HRA, TA, DA, etc.), tax deductions
	Calculate income and expenditure for budgeting
	Discuss the legal rights, laws, and aids
9. Essential Digital Skills	Describe the role of digital technology in day-to-day life and the workplace
	Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
	Demonstrate how to connect devices securely to internet using different means
	Follow the dos and don'ts of cyber security to protect against cyber crimes
	Discuss the significance of displaying responsible online behaviour while using various social media platforms
	Create an e-mail id and follow e- mail etiquette to exchange e -mails
	Show how to create documents, spreadsheets and presentations using appropriate applications
10. Entrepreneurship	Describe the types of entrepreneurship and enterprises
	Discuss the process of identifying opportunities for potential business and relevant regulatory and statutory requirements
	Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement

	Create a sample business plan, for the selected business opportunity
	Discuss various sources of funding and identify associated financial and legal risks with its mitigation plan
11. Customer Service	Describe different types of customers
	Role play a situation on how to identify customer needs and respond to them in a professional manner
	Explain various tools used to collect customer feedback
12. Getting ready for apprenticeship & Jobs	Draft a professional Curriculum Vitae (CV)
	Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
	Demonstrate how to apply to identified job openings using offline /online methods as per requirement
	Discuss the significance of maintaining hygiene and dressing appropriately
	Discuss how to prepare for an interview
	Role play a mock interview
	List the steps for searching and registering for apprenticeship opportunities

NSQC



**SECTION 2**

**25. EVIDENCE OF LEVEL**

**OPTION A**

Title/Name of qualification/component: FITTER			Level: 4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
Process	<p><b>Requires Well Developed Skill, with clear choice of procedures in familiar context</b></p> <ul style="list-style-type: none"> <li>Produce components by different operations and check accuracy using appropriate measuring instruments. <i>[Different Operations - Drilling, Reaming, Taping, Dieing; Appropriate Measuring Instrument – Vernier, Screw Gauge, Micrometre].</i></li> <li>Make different fit of components for assembling as per required tolerance observing principle of interchange ability and check for functionality. <i>[Different Fit – Sliding, Angular, Step fit, 'T' fit, Square fit and Profile fit; Required tolerance: <math>\pm 0.04</math> mm, angular tolerance: 30 min.]</i></li> </ul>	<p>The learner is expected to produce components by performing different operations, check accuracy using appropriate measuring instruments, make different fit of components for assembling as per required tolerance observing principle of interchange ability and check for functionality etc. The above tasks performed by the learner require demonstrating well developed skill with clear choice of procedures which are familiar in context. In all these tasks the learner has to apply one's knowledge and decide what needs to be done to either meet the client's requirement or identify fault and decide how to rectify it or plan as per the layout and conditions available.</p>	4

Title/Name of qualification/component: FITTER			Level: 4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
	<ul style="list-style-type: none"> <li>Manufacture simple sheet metal items as per drawing and join them by soldering, brazing and riveting.</li> </ul>	Hence NSQF Level is 4 for this descriptor.	
Professional knowledge	<p><b>Knowledge of facts in the field of work or study</b></p> <ul style="list-style-type: none"> <li>Bench vice construction, types, uses, care &amp; maintenance, vice clamps, hacksaw frames and blades, specification, description, types and their uses, method of using hacksaws.</li> <li>Marking off and layout tools, dividers, scribing block, odd leg calipers, punches-</li> </ul>	The learner is expected to possess and demonstrate the knowledge of bench vice construction, their types and uses, marking off and layout tools' description, classification, care and maintenance. He/she should know about the physical properties of engineering metal like their colour, weight, structure, conductivity, ductility, fusibility, etc. and also about mechanical properties like malleability, tenacity, hardness, elasticity etc. The learner is expected to follow the	4

Title/Name of qualification/component: FITTER			Level: 4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
	<p>description, classification, material, care &amp; maintenance.</p> <p><b>Knowledge of Principles and general concepts in the field of work or study</b></p> <ul style="list-style-type: none"> <li>Principle of cutting screw thread in centre lathe –principle of chasing the screw thread – use of centre gauge, setting tool for cutting internal and external threads, use of screw pitch gauge for checking the screw thread, etc.</li> </ul> <p><b>Knowledge of processes in the field of work or study</b></p> <ul style="list-style-type: none"> <li>Physical properties of engineering metal: colour, weight, structure, and conductivity, magnetic, fusibility, specific gravity. Mechanical properties: ductility, malleability hardness, brittleness, toughness, tenacity, and elasticity.</li> </ul>	<p>principle of cutting screw thread in centre lathe, principle of chasing the screw thread, etc.</p> <p>The above knowledge expected to be possessed by the learner are the knowledge of facts, principles, processes and general concepts required in this field of work or study.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	
Professional skill	<ul style="list-style-type: none"> <li>Join metal components by riveting observing standard procedure.</li> </ul>	The learner is expected to plan and perform simple repair works, cut and join metal	4

Title/Name of qualification/component: FITTER			Level: 4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
	<ul style="list-style-type: none"> <li>Join metal component by arc welding observing standard procedure.</li> <li>Cut and join metal component by gas (oxyacetylene).</li> <li>Plan &amp; perform simple repair, overhauling of different machines and check for functionality. [<i>Different Machines – Drill Machine, Power Saw, Bench Grinder and Lathe</i>].</li> </ul>	<p>component by different processes like riveting, arc welding, gas welding etc. The above tasks require a range of cognitive and practical skills to accomplish tasks which also involves estimating bill of materials and cost required for the job or planning as per requirement. Detect fault and decide the course of action. All these actions involve planning and solving problems by selecting and applying basic methods, tools, materials and information.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	
Core skill	<p><b>Desired Mathematical Skills</b></p> <ul style="list-style-type: none"> <li>Explain science in the field of study including simple machine.</li> </ul> <p><b>Understanding of social/political</b></p> <ul style="list-style-type: none"> <li>Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal &amp; societal growth.</li> </ul>	<p>The learning outcomes for example 'Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal &amp; societal growth' and 'Interpret &amp; use formal and technical communication' are the learning outcomes where the learner needs to display desired mathematical skill; understanding of social, political; and some skill of collecting and organizing information, communication.</p>	4

Title/Name of qualification/component: FITTER			Level: 4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
	<p><b>Organizing information and communication</b></p> <ul style="list-style-type: none"> <li>Interpret &amp; use formal and technical communication.</li> </ul>	Hence NSQF Level is 4 for this descriptor.	
Responsibility	<ul style="list-style-type: none"> <li>Identify dismantle, replace and assemble different pneumatics and hydraulics components. <i>[Different components – Compressor, Pressure Gauge, Filter Regulator Lubricator, Valves and Actuators.]</i></li> <li>Construct circuit of pneumatics and hydraulics observing standard operating procedure&amp; safety aspect.</li> <li>Make drill jig &amp; produce components on drill machine by using jigs and check for correctness.</li> </ul>	<p>The role of Fitter is independently responsible to perform the work as per specifications and their own analysis of what needs to be done based on their understanding of fitting processes, principles and standardsto achieve desired outcome. Here the learner takes responsibility for own work and learning and some responsibility of other’s works and learning.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	4

**SECTION 3**  
**EVIDENCE OF NEED**

26	<p><b>What evidence is there that the qualification is needed? What is the estimated uptake of this qualification and what is the basis of this estimate?</b></p> <table border="1" data-bbox="355 546 1404 1693"> <thead> <tr> <th data-bbox="355 546 643 689"><b>Basis</b></th> <th data-bbox="643 546 1404 689"><b>In case of other Awarding Bodies (Institutes under Central Ministries and states departments)</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="355 689 643 1070">Need of the qualification</td> <td data-bbox="643 689 1404 1070">Capital Goods and Manufacturing Sector has a significant presence of organized as well as unorganized skilled manpower requirement. This sector is poised to grow exponentially in the years to come and is highly labor intensive and there are many emerging trends in this sector. Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.</td> </tr> <tr> <td data-bbox="355 1070 643 1496">Industry Relevance</td> <td data-bbox="643 1070 1404 1496">The job role defined for the qualification is as per the National Classification of Occupations 2015 which is developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. Moreover, the training is imparted in ITIs/ NSTIs/ MSTIs/ BTC/ BTPs/ Industries / Establishments etc. where such requirement is available. This justifies the qualification is very much relevant for industry.</td> </tr> <tr> <td data-bbox="355 1496 643 1626">Usage of the qualification</td> <td data-bbox="643 1496 1404 1626">The Proposed qualification will create skilled Technician for various establishments in different Sectors.</td> </tr> <tr> <td data-bbox="355 1626 643 1693">Estimated uptake</td> <td data-bbox="643 1626 1404 1693">The present seating capacity is 703248.</td> </tr> </tbody> </table>	<b>Basis</b>	<b>In case of other Awarding Bodies (Institutes under Central Ministries and states departments)</b>	Need of the qualification	Capital Goods and Manufacturing Sector has a significant presence of organized as well as unorganized skilled manpower requirement. This sector is poised to grow exponentially in the years to come and is highly labor intensive and there are many emerging trends in this sector. Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.	Industry Relevance	The job role defined for the qualification is as per the National Classification of Occupations 2015 which is developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. Moreover, the training is imparted in ITIs/ NSTIs/ MSTIs/ BTC/ BTPs/ Industries / Establishments etc. where such requirement is available. This justifies the qualification is very much relevant for industry.	Usage of the qualification	The Proposed qualification will create skilled Technician for various establishments in different Sectors.	Estimated uptake	The present seating capacity is 703248.
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Estimated uptake	The present seating capacity is 703248.										
27	<p><b>Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences.</b></p>										

	The qualification originally designed for Craftsman Training Scheme is in existence for many years and approved by DGT (Regulatory Body) under Ministry of Skill Development and Entrepreneurship, Govt. of India.
<b>28</b>	<p><b>What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF? Give justification for presenting a duplicate qualification</b></p> <p>The qualification is originally designed and approved by DGT for the Craftsman Training Scheme and is in existence for many years. No such duplicate qualification of same duration and competencies exists.</p>
<b>29</b>	<p><b>What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated? Specify the review process here</b></p> <ul style="list-style-type: none"> <li>• The research wing of CSTARI &amp; DGT reviews and updates the qualification, in consultation with industries and other stakeholders, on a regular basis by conducting trade committee meetings.</li> <li>• DGT will monitor any duplicity by comparing existing qualifications with upcoming ones in the National Qualifications Register (NQR) and relevant sectors.</li> </ul>

**SECTION 4**  
**EVIDENCE OF PROGRESSION**

**30** **What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector? Show the career map here to reflect the clear progression**

On completion of the training the trainee will have an opportunity to move in vertical/horizontal pathways to promote to higher designations. The learner can further undergo other specialised courses to excel in the relevant field.

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graph LR
    A[Technician] --> B[Senior Technician]
    B --> C[Supervisor]
    C --> D[Manager]
    B --> E[Entrepreneur]
  
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