

NSQF QUALIFICATION FILE

Approved in 22th NSQC Meeting-NCVET-25th August 2022

Dental Laboratory Equipment Technician

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/HLT/DGT/06274

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:

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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 Skill (Employability Skill).

● **SUMMARY**

1	Qualification Title	'DENTAL LABORATORY EQUIPMENT TECHNICIAN'
2	Qualification Code, if any	DGT/ 1047
3	NCO code and occupation	3214.9900 - Medical and Dental Prosthetic Technicians 3214.0100 - Dental Mechanic
4	Nature and purpose of the qualification (Please specify whether qualification is short term or long term)	Prepare skilled Technician to undertake the job roles of Dental Laboratory Equipment Technician and will enable the trainee to make use of different dental laboratory materials for fabrication of dental prosthesis, perform teeth setting and also plan and process the denture, repair broken denture and reline the denture etc. It is a long term qualification.
5	Body/bodies which will award the qualification	Directorate General of Training (DGT).
6	Body which will accredit providers to offer courses leading to the qualification	Directorate General of Training (DGT) accredits the Training providers (ITIs/ NSTIs/ MSTIs/ BTCs/ BTPs / Industries / Establishments).
7	Whether accreditation/affiliation norms are already in place or not , if applicable (if yes, attach a copy)	Yes. The accreditation/ affiliation norms and any amendments made from time to time are available on DGT web portal.
8	Occupation(s) to which the qualification gives access	<ul style="list-style-type: none"> ● Medical and Dental Prosthetic Technicians ● Dental Mechanic
9	Job description of the occupation	Dental Laboratory Equipment Technician will be able to make use of different dental laboratory materials for fabrication of dental prosthesis, perform teeth setting and also plan and process the denture, repair broken denture and reline the denture, construct immediate dentures, removable partial dentures and also perform survey, fabricate temporary acrylic jacket crowns etc.
10	Licensing requirements	NOT REQUIRED

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11	Statutory and Regulatory requirement of the relevant sector (documentary evidence to be provided)	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>1st Year</th> <th>2nd 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></td> <td>Total</td> <td>1200</td> <td>1200</td> </tr> <tr> <td></td> <td>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 st Year	2 nd Year	1	Professional Skill (Trade Practical)	840	840	2	Professional Knowledge (Trade Theory)	240	300	3	Employability Skills	120	60		Total	1200	1200		On the Job Training (OJT)/ Group Project	150	150
S No.	Course Element	Notional Training Hours																										
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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	Passed 10th class examination. Minimum age 14 years as on first day of academic session.																										
16	Progression from the qualification (Please show Professional and academic progression)	<p>An Individual can proceed for:</p> <table border="1"> <tr> <td>Professional</td> <td>Technical / Academic</td> </tr> <tr> <td> <ul style="list-style-type: none"> • Technician • Senior Technician • Supervisor • Manager • Entrepreneur </td> <td> <ul style="list-style-type: none"> ATS CITS Diploma/ Advance Diploma (Vocational) </td> </tr> </table>	Professional	Technical / Academic	<ul style="list-style-type: none"> • Technician • Senior Technician • Supervisor • Manager • Entrepreneur 	<ul style="list-style-type: none"> ATS CITS Diploma/ Advance Diploma (Vocational) 																						
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17	Arrangements for the	<ul style="list-style-type: none"> • Yes (For more details refer "Guidelines 																										

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	Recognition of Prior learning (RPL)	for Private candidate” in DGT website MIS portal).		
18	International comparability where known (research evidence to be provided)	-		
19	Date of planned review of the qualification.	3 Yrs from the Date of Approval		
20	Formal structure of the qualification			
	Mandatory components			
	Title of component and identification code/NOSs/ Learning Outcomes	Estimated size (learning hours)		Level
		Skills	Knowledge	
TRADE SPECIFIC				
(i)	Identify the basic safety of occupational health process and differentiate between the various responsibilities of the dental team in providing dental treatment following safety precautions. (NOS:HSS/N9405)	22	6	4
(ii)	Weigh various metals and alloys used in dental laboratory and also measure temperature and monitor its effects in dental laboratory. (NOS:HSS/N9406)	20	6	4
(iii)	Establishes relevance of melting point of different alloys used in dental laboratories. (NOS:HSS/N9407)	23	6	4
(iv)	Apply accurate voltage system required to operate various machines with electrical	20	6	4

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	safety. (NOS:HSS/N9408)			
(v)	Select various alloys as per requirement for fabrication of dental prosthesis. (NOS:HSS/N9409)	22	6	4
(vi)	Manipulate and use gypsum products efficiently and dental cement effectively. (NOS:HSS/N9410)	40	12	4
(vii)	Manipulates and uses dental waxes and impression materials and uses dental based materials effectively. (NOS:HSS/N9411)	21	6	4
(viii)	Make diagnostic and master casts, special trays and occlusal runs and articulates casts. (NOS:HSS/N9412)	80	24	4
(ix)	Perform teeth setting. (NOS:HSS/N9413)	45	12	4
(x)	Plan and process the denture and also repair broken denture and reline the denture. (NOS:HSS/N9414)	65	18	4
(xi)	Identify and select wires and fabricates retentive components of orthodontic appliances and make retractive components of orthodontic appliances. (NOS:HSS/N9415)	45	12	4
(xii)	Make active components of orthodontic appliances and prosthesis orthodontic appliances. (NOS:HSS/N9416)	45	12	4
(xiii)	Carve various maxillary anterior teeth, mandibular anterior teeth, maxillary premolar, mandibular premolar, maxillary molars and mandibular molars. (NOS:HSS/N9417)	200	60	4
(xiv)	Duplication of casts. (NOS:HSS/N9418)	22	6	4
(xv)	Identify and apply various concepts of occlusion in all dental casts (NOS:HSS/N9419)	20	6	4
(xvi)	Identify partial denture classification, construct immediate dentures and construct removable partial dentures and also survey the removable partial denture.	65	18	4

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	(NOS:HSS/N9420)			
(xvii)	Prepare appropriate retention features in removable partial dentures. (NOS:HSS/N9421)	20	6	4
(xviii)	Identify the fixed components of orthodontic appliances and fabricate oral screen, activator and weld appliances. (NOS:HSS/N9422)	65	18	4
(xix)	Fabricate temporary acrylic jacket crowns. (NOS:HSS/N9423)	70	24	4
(xx)	Prepare various cast, die for fixed partial denture, full metal crown and full metal bridges. (NOS:HSS/N9424)	370	126	4
(xxi)	Familiarize with equipment used in fixed prosthodontics and mock up of anterior crowns. (NOS:HSS/N9425)	130	38	4
(xxii)	Fabricate copings and prepare die. (NOS:HSS/N9426)	120	60	4
(xxiii)	Fabricate porcelain fused to metal crown. (NOS:HSS/N9427)	150	52	4
	Total	1680	540	
CORE SKILL				
EMPLOYABILITY SKILLS				
(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	-		-

(x)	Entrepreneurship	-	-
(xi)	Customer Service	-	-
(xii)	Getting Ready for Apprenticeship & Jobs	-	-
	Total	2400	
	OJT/ Group Project	300	

SECTION 1
ASSESSMENT

21	Body/Bodies which will carry out assessment: Controller of Examinations, DGT
22	<p>How will RPL assessment be managed and who will carry it out? 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. (Refer Annexure III for list of allied trades)</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. II.</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</p>

he/she intends to appear for AITT as Private Candidate. Mapping of CoE trades, with that of regular CTS trades is provided in Annexure IV. CoE candidates must register as 'Private Candidate' under CTS in the relevant/mapped CTS trade only.

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.

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 Factories Act 1948 and Shops and Establishments Act applicable for the concerned State.

Category III: SCVT Candidates (admitted till August 2018 session)

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' (Refer Annexure V).

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'.

Category IV: Other Candidates (candidate not falling in any of the above 3 categories, including SCVT trainees enrolled from admission session 2019 onwards)

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.

B. Applicant should be minimum 21 years of age on the date of submission of application. There is no upper age limit.

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.

For updated information please refer to DGT web portal.

23	<p>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.</p> <p>(1) Assessment process: 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 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.</p> <p>The marking pattern and distribution of marks for the qualification are as under:</p> <table border="1"> <thead> <tr> <th colspan="5">Marking Pattern</th> </tr> <tr> <th>Sl. No.</th> <th>Type of Assessment</th> <th>Subject for the Trade Test</th> <th>Marks for the 1st Year</th> <th>Marks for the 2nd Year</th> </tr> </thead> <tbody> <tr> <td>1</td> <td rowspan="2">Summative</td> <td>Practical</td> <td>250</td> <td>250</td> </tr> <tr> <td>2</td> <td>Trade Theory</td> <td>100</td> <td>100</td> </tr> </tbody> </table>	Marking Pattern					Sl. No.	Type of Assessment	Subject for the Trade Test	Marks for the 1st Year	Marks for the 2nd Year	1	Summative	Practical	250	250	2	Trade Theory	100	100
Marking Pattern																				
Sl. No.	Type of Assessment	Subject for the Trade Test	Marks for the 1st Year	Marks for the 2nd Year																
1	Summative	Practical	250	250																
2		Trade Theory	100	100																

3	Assessment	Employability Skills	50	50
4	Formative assessment based on Learning Outcomes		200	200
TOTAL:			600	600

(2) Minimum pass marks:

The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%.

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 and Employability Skills.
- While Trade Theory and Trade Practical are used for assessing Trade-related jobs and Employability skills is used to test the communication, professional language, leadership, entrepreneurship and team-work abilities of the trainee.

	<ul style="list-style-type: none"> In addition to demonstration of theory and practical knowledge, trainees get a chance to present total personality. <p>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.</p>
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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:

Serial No.	Terminal Competency	Maximum Weightage (%)
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 OUTCOME	ASSESSMENT CRITERIA
FIRST YEAR	
1. Identify the basic safety of occupational health process and differentiate between the various responsibilities of the dental team in providing dental treatment following safety precautions. (NOS:HSS/N9405)	Practice individual responsibility in relation to maintaining workplace health safety and security requirements.
	Comply with health, safety and security procedures for the work place.
	Report any identify breaches in health, safety and security procedures to the designated persons.
	Identify potential hazards at work place.
	Complete any health and safety records accurately.
	Maintain personal hygiene and contribute effectively and actively to the health check ecosystem.
	Identify different team members working in a dental set up.
	Establish appropriate communication with the different persons designated to perform different tasks in a dental set up.
	Seek supervision for the work to be performed from suitable and designated professional of the dental team.
	Maintain competence within the role and field of practice.
2. Weigh various metals and alloys used in dental laboratory and also measure temperature and monitor its effects in dental laboratory. (NOS:HSS/N9406)	Identify appropriate metal and alloys used in dental laboratories.
	Prepare and calibrate equipment for weighting.
	Properly measures desired amount of metal or alloy required to make or prosthesis.
	Avoid wastage of metal and alloys.
	Records the weighed alloy legibly and correctly.

	Reads temperature efficiently and records it legibly in the book.
	Understands the effects of change in temperature in dental laboratory towards the processing of prosthesis.
	Identifies temperature of environment and modifies the techniques as per requirement.
3. Establishes relevance of melting points of different alloys used in dental laboratory. (NOS:HSS/N9407)	Knows the significance of melting point of alloys which are used in dental laboratory.
	Chooses the alloy used for casting various prosthesis in dental laboratory.
	Matches the coefficient of thermal expansion of alloys with the ceramic system.
4. Apply accurate voltage system required to operate various machines with electrical safety. (NOS:HSS/N9408)	Knows the power consumption of every equipment.
	Proficiently reads the power output to the machines.
	Recognize appropriate voltage stabilizers installed with the equipment.
	Switch off the machines during interrupted power supplies.
	Reports the power setbacks to the concerned authority.
	Knows about electrical hazards which can occur in a dental laboratory.
	Safely operates all electrical equipments.
	Can manage electrical fires or short circuits.
	Can administer first aid for electrical burns and shock
5. Selects various alloys as per requirement for fabrication of dental prosthesis. (NOS:HSS/N9409)	Identifies different alloy systems used in dentistry.
	Understand physical and mechanical properties of various alloy used in dentistry.
	Selects the appropriate alloy for a specific prosthesis to be

	fabricated.
	Can read and apply specific manipulating instruction supplied along with the alloy from the manufactures.
6. Manipulate and use gypsum products efficiently and dental cement effectively. (NOS:HSS/N94010)	Identifies various forms of gypsum products used in dentistry.
	Follows instructions for manipulation for gypsum products.
	Selects appropriate gypsum product to be used for a specific purpose in dental laboratory.
	Applies mixing ratio of powder and liquid, mixing time, working time and setting time appropriately.
	Alters the properties of gypsum products by adding accelerators and retarders.
	Can identify dental cements used in dentistry.
	Arranges all materials to be used while mixing.
	Knows about the properties of dental cements.
	Knows the application of individuals cement.
	Manipulates the cements according to manufacturer's instructions.
Loads the material efficiently and carefully for transfer.	
7. Manipulates and uses dental waxes and impression materials and uses dental based materials effectively. (NOS:HSS/N9411)	Identifies various types of waxes used in dental laboratory.
	Knows the properties of dental waxes used in dentistry.
	Uses appropriate armamentarium used to manipulate waxes.
	Manipulates the waxes efficiently.
	Maintains uniform heating of waxes.
	Stores the work done with wax at appropriate temperature.
	Identifies the impression materials used in dentistry.

	Arranges appropriate armamentarium used to manipulate impression materials.
	Knows the properties of dental impression materials.
	Effectively loads the impression materials.
	Handle impressions carefully to avoid distortion.
	Disinfects impressions carefully.
	Stores impressions as recommended.
	Knows the use of denture base materials.
	Knows the properties of denture base materials.
	Read manufacturer's instructions carefully.
	Manipulates the denture base materials as per recommended instructions to avoid bubbles.
	Stores the denture base materials at appropriate temperatures.
	Carefully avoids contamination of denture base materials while manipulating.
8. Make diagnostic and master casts, special trays and occlusal runs and articulates casts. (NOS:HSS/N9412)	Disinfects the impression while observing not to distort the impression thoroughly understands all the instruction provided by dentistry.
	Identify the materials and equipment required for preparing the cast.
	Prepare equipment and materials required to fabricate cast.
	Prepare master cast using approved die stone free of bubble void or damage.
	Produce opposing cast using approved base foree with approved stone, free of bubble, void or damage.
	Trims the cast to produce finished cast
	Examines the cast carefully to notice any defect in the cast.

	Knows the purpose of special trays.
	Assembles all equipment and armamentarium used to make special tray.
	Applies separating medium properly on cast.
	Adapts spacer on the cast efficiently.
	Uses raw material if indicioucly avoiding wastage.
	Fabricate special tray on the cast both upper and lower.
	Knows anatomical landmarks of the cast both maxillary and mandibular.
	Terms and finishes the specials tray smoothly.
	Avoid incorporation of any defects while fabricating special tray.
	Knows the significance of making occlusal rims.
	To familiar with the concept of jaw relation.
	Knows the dimensions of maxillary and mandibular rims.
	Articulates the casts with the rims on the desired articulator.
	Can check the articulator accuracy before mounting the casts.
	Follows planes of occlusion while articulating the casts.
9. Perform teeth setting. (NOS:HSS/N9413)	Selects teeth according to the requirements of the dentist.
	Seeks communication with the dentist to confirm the teeth selected.
	Knows the principles of anterior teeth setting.
	Knows the principles of posterior teeth setting.
	Knows the concepts of occlusion and its various types.
	Does teeth setting on the occlusal rims and incorporates functional principles of teeth setting.
	To able to produce gum patterns in wax.

	Produces a neat finish in teeth setting and wax up.
10. Plan and process the denture and also repair broken denture and reline the denture. (NOS:HSS/N9414)	Carefully selects the appropriate size of flasks for the denture to be processed.
	Assembles all equipment and raw material required for denture processing.
	Flasks the denture carefully in flasks
	Applies separating medium carefully
	Dewaxes the denture maintaining intact position of the teeth in the flask.
	Mixes heat cure powder and liquid in appropriate ratio.
	Packs heat cure dough into the flask.
	Removes all flash while packing.
	Acrylizes the denture at the desired temperature and at the chosen cycle.
	Carefully de-flasks denture after bench working.
	Returns the dentures from the flask efficiently.
	Trims the denture as desired to produced finished surface.
	Polishes the denture to make a polished denture free of all defects.
	Can assess whether the broken denture can be repaired or not.
	Assembles and seats all parts of broken denture on the cast.
	Informs the dentist about the success probabilities to repair
	Carries out procedure of repair the denture as desired.
	Carefully selects the raw material required to repair the denture as to closely match the material with the previous material used.
Produces a finished and polished repaired denture.	

	Knows the concept of relining of denture.
	Carefully seats denture to be relined on new cast.
11. Identify and select wires and fabricates retentive components of orthodontic appliances and make retractive components of orthodontic appliances. (NOS:HSS/N9415)	Can select the appropriate gauge of wire for making desired components of clasp.
	Can make pin bead clasp.
	Can adapt C clasp.
	Can make Adam's clasp.
	Can hold the armamentarium properly
	Can seat the components on the cast
	Can differentiate between retentive and retractive components of appliances.
	Understands the concept of retractive components and can activate their working.
	Can make labial bows of both long and short types.
	Can adapt lateral bows well on the surface of the cast.
Can use appropriate wire for their fabrication.	
12. Make active components of orthodontic appliances and prosthesis orthodontic appliances. (NOS:HSS/N9416)	Knows the concept of active components and can activate their working.
	Can identify wires and use them for their fabrication.
	Can make all types of springs.
	Can adapt all types of springs on the surface of the cast.
	Fabricates all the components of the desire appliances.
	Assembles all the components of the appliance on the surface of the cast.
	Fabricates simple retention plate (Hawley's retention

	appliances).
	Fabricates tongue thrusting appliances.
	Fabricates expansion screw appliances.
	Acrylics the appliance free of defects.
	Finishes and polishes the appliances.
13. Carve various maxillary anterior teeth, mandibular anterior teeth, maxillary premolar, mandibular premolar, maxillary molars and mandibular molars. (NOS:HSS/N9417)	Knows the placement of maxillary anterior teeth in the mouth.
	Knows the detailed anatomy of central incisor, lateral incisor and canine.
	Knows the dimensions of central incisor, lateral incisor and canine.
	Carves maxillary central incisor on wax block and reproduce all anatomical landmarks on the wax block.
	Carves maxillary lateral incisor on wax block and reproduces all anatomical landmarks on the wax block.
	Carves canine on the block and reproduces all anatomical landmarks on the wax block.
	Knows the placement of all mandibular anterior teeth
	Knows the detailed anatomy of all mandibular anterior teeth.
	Knowsthe dimensions of all maindibular anterior teeth.
	Carves manibular central mandibular and reproduce all anatomical landmarks on the wax block.
	Curves manibular canine and reproduces all anatomical landmarks on the wax blocks.
	Knows the placement of maxillary premolar in the mouth.
	Knows the detailed anatomy of maxillary first and second premolar.
	Knows the dimension of maxillary premolar.
Causes maxillary first premolar and reproduces all anatomical	

	landmarks on the wax block.
	Causes maxillary second premolar and reproduces all anatomical landmarks on the wax block.
	Knows the placement of mandibular premolars in the mouth.
	Knows the detailed anatomy of mandibular premolar first and second.
	Knows the dimensions of mandibular premolars.
	Carves mandibular first premolar and reproduces all anatomical landmarks on the wax block.
	Carves mandibular second premolar and reproduces all anatomical landmarks on the wax block.
	Knows the placement of all maxillary molars in the mouth.
	Knows the detailed anatomy of all maxillary molars.
	Carves maxillary first molar and reproduces all anatomical details on the wax block.
	Carves maxillary second molar and reproduces all anatomical details on the wax block.
	Knows the placement of all maxillary molars in the mouth.
	Knows the detailed anatomy of all mandibular molars.
	Knows the dimensions of all mandibular molars.
	Carves mandibular first molar and reproduces all anatomical details on the wax block.
	Carves mandibular second molar and reproduces all anatomical details on the wax block.
14. Duplication of casts. (NOS:HSS/N9418)	Knowledge of material agar-agar.
	Assembles the equipments to be used for duplication of cast.
	Examines the master cast to be duplicated.

	Trims and finishes the cast.
15. Identify and apply various concepts of occlusion in all dental casts. (NOS:HSS/N9419)	Understands the term occlusion.
	Knows the classification of occlusion can classify casts based on occlusion.
	Understand various curves of occlusion.
	Can reproduce desired occlusion patterns in the casts.
16. Identify partial denture classification, construct immediate dentures and construct removable partial dentures and also survey the removable partial denture. (NOS:HSS/N9420)	Knows the difference between partial dentures and complete dentistry.
	Can classify partial denture.
	Use Kennedy's classification system.
	Is well versed with applegate's rules of application to kennedy system of classification.
	Knows the concept and indications of immediate dentures.
	Knows the complete process of immediate dentures on partial dentures.
	Assembles all armamentarium required to make immediate dentures.
	Fabricates immediate denture.
	Finishes and polishes immediate denture.
	Knows the principles involved in the fabrication of partial denture.
	Can design partial denture to be fabricated to meet aesthetic and functional needs.
	Examines the master cast on which removable partial denture would be fabricated.
	Duplicates removable partial denture following all metal steps sequentially.

	Finishes and polishes fabricated removal partial denture.
	Can identify surveyor and all its parts.
	Surveys the master cast with all the lines and wakes there properly on the media cast.
17. Prepare appropriate retention features in removable partial dentures. (NOS:HSS/N9421)	Knows about the structure features and components to be incorporated in the removable partial denture.
	Can design sleek and appropriate relative features as per required cut of the prosthesis.
	Can incorporate these features in the cast.
18. Identify the fixed components of orthodontic appliances and fabricate oral screen, activator and weld appliances. (NOS:HSS/N9422)	Knows about removable and fixed orthodontics and difference between them.
	Can identify the fixed components of fixed orthodontics like bands, arches, brackets etc.
	Knows the construction of bands, tubes arches and brackets etc.
	Knows about myofunctional appliances.
	Assembles armamentarium necessary for making oral screen and activator.
	Examines casts and occludes them in accurate position for both the arches.
	Adapts wire bending required.
	Acrylize the prosthesis.
	Finishes and polishes the prosthesis.
	Understands welding and spot welding and the difference between them.
Assembles the equipments and raw material required to do welding.	

	Assembles the parts to be welded.
	Performs welding.
	Finishes and polishes the appliances.
SECOND YEAR	
19. Fabricate temporary acrylic jacket crowns. (NOS:HSS/N9423)	Is familiar with the term temporary a jacket crowns.
	Examines the cast for accuracy for making jacket crowns
	Waxes up the tooth with modelling wax to full anatomic contour.
	Flasks the crown appropriately dewaxes the crown.
	Selects appropriate shade for packing.
	Acrylizes the crown.
	Finishes the crown.
20. Prepare various cast, die for fixed partial denture, full metal crown and full metal bridges. (NOS:HSS/N9424)	Pours the cast in die stone.
	Trims the cast and marks the pinning points on the cast.
	Pin the cast.
	Die cuts the cast.
	Ditches the die.
	Applies die hardener spacer and separator.
	Knows the complete process of making metal crowns.
	Examines the cast for accuracy.
	Waxes up the crown to full anatomic crown.
	Sprues the crown at the desired surface.
	Invests the crown in the investing ring.
	Selects the appropriate investment material.
	Casts the units with appropriate alloy.

	Divests the investing ring.
	Trims and finishes the crowns polish the crown.
	Knows the difference between full unit metal and three Unit Bridge.
	Examines the cast for accuracy.
	Waxes up the cast for three Unit Bridge to full anatomic contour.
	Designs suitable pontics.
	Selects appropriate connector design.
	Sprues the bridge at the desired surface.
	Invests the bridge in the investing ring.
	Selects the appropriate investment material.
	Casts the units with appropriate alloy.
	Divests the investing ring.
	Trims and finishes the bridge.
	Polishes the bridge.
21. Familiarize with equipment used in fixed prosthodontics and mock up of anterior crowns. (NOS:HSS/N9425)	Identifies the equipment utilized in fixed prosthodontics.
	Handles the equipment according to manufacturer instructions.
	Operates the equipment smoothly.
	Records the breakdowns of the apparatus and informs the authorized authorities.
	Understands the term mock up and its relevance.
	Knows the anatomy of the tooth/ teeth to be mocked up.
	Analyzes the cast for accurateness and free of defects before starting mock up.
	Assembles all equipment, tools and raw materials for mock up.

NSQF QUALIFICATION FILE

Approved in 22th NSQC Meeting-NCVET-25th August 2022

Dental Laboratory Equipment Technician

	Performs mock up of desired teeth.
22. Fabricate copings and prepare die. (NOS:HSS/N9426)	Understands the term metal substructure or copings.
	Knows where copings are desired.
	Designs the copings according to the requirement of the cast.
	Check the cast of accuracy assembles desired armamentarium.
	Manipulates blue inlay wax with the urgent techniques and adapts it well to make wax copings.
	Makes proper collar in wax and seals the cervical outline efficiently.
	Spaces the copings at the prescribed area.
	Invests the copings in the investing ring of right size chooses appropriate investment material.
	Casts the copings with suitable alloy.
	Trims and finishes the copings by sequentially using the desired Equipments.
	Knows the purpose of cutting the cast into die.
	Assembles armamentarium required for die cutting the die.
	Trims the cast, indexes the cast.
	Pins the cast.
	Cuts the die, ditches the die.
	Seals the defects of the cast if any after communicating with the dentist.
Applies die hardener, spacer and separator in the layers.	
23. Fabricate porcelain fused to metal crown. (NOS:HSS/N9427)	Knows the types of fixed crowns that are made.
	Knows the steps and process to fabricate different types of

	crowns.
	Selects appropriate ceramic systems & shades, oxidises the copings.
	Applies opaque and wash opaque smoothly and fires at right temperature in the porcelain furnace.
	Applies dentin on the opaque layer fired.
	Holds the crown properly while firing
	Assesses if 2nd denture build up and firing is required
	Applies enamel and finishes the crown with ceramic finishing burs.
	Glazes the crown.

EMPLOYABILITY SKILLS (CORE SKILL)	
LEARNING OUTCOME	ASSESSMENT CRITERIA
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 Approved

SECTION 2

25. EVIDENCE OF LEVEL

OPTION A

Title/Name of qualification/component: Dental Laboratory Equipment Technician			Level:
4			
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
Process	<p>Requires Well Developed Skill</p> <ul style="list-style-type: none"> Identify the fixed components of orthodontic appliances and fabricate oral screen, activator and weld appliances. Fabricate temporary acrylic jacket crowns. Make diagnostic and master casts, special trays and occlusal runs and articulates casts. Perform teeth setting. <p>Clear choice of procedures in familiar context</p> <ul style="list-style-type: none"> Select various alloys as per requirement for fabrication of dental prosthesis. Plan and process the denture and also repair broken denture and reline the denture. Identify and select wires and fabricates retentive components of orthodontic 	<p>The learner requires to demonstrate a well-developed skill as indicated in learning outcomes like "Make diagnostic and master casts, special trays and occlusal runs and articulates casts", "Perform teeth setting", "Fabricate temporary acrylic jacket crowns" etc. to the accuracy demanded as per the job. The learner requires to apply clear choice of procedures in familiar context as indicated in the learning outcomes like "Select various alloys as per requirement for fabrication of dental prosthesis", "Plan and process the denture and also repair broken denture and reline the denture", "Identify and select wires and fabricates retentive components of orthodontic appliances and make retractive components of orthodontic appliances" etc. In these learning outcomes the learner has to apply ones</p>	4

Title/Name of qualification/component: Dental Laboratory Equipment Technician			Level:
4			
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
	<p>appliances and make retractive components of orthodontic appliances.</p> <ul style="list-style-type: none"> • Duplication of casts. • Identify and apply various concepts of occlusion in all dental casts. 	<p>knowledge and decide what needs to be done or plan as per requirements and resources available.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	
Professional knowledge	<p>Knowledge of facts in the field of work or study</p> <ul style="list-style-type: none"> • Study of dental materials- Gypsum products • Study of dental waxes. • Study of impression materials. • Nomenclature of teeth. • Kennedy's classification of Partial Denture. <p>Knowledge of Principles and general concepts in the field of work or study</p> <ul style="list-style-type: none"> • Principles of wire bending and retention components. • Theory of occlusal rims and articulation. • Principles of Partial Denture Design. <p>Knowledge of processes in a field of work or study</p> <ul style="list-style-type: none"> • Explain and discuss Acrylization of denture. 	<p>The learner requires to demonstrate knowledge of facts, principles, processes and general concepts, in the field of Orthodontics and Dentistry i.e Knowledge of Dental materials, Waxes, Impression Materials etc. Also the learner requires to demonstrate knowledge of identification, application and operation of equipment necessary in the fabrication of prosthesis, Choosing right systems and knowledge of Advances in dental ceramics. The learner requires to demonstrate knowledge of principles and general concepts of Occlusal rims and articulation, Principles of wire bending and retention components and Principles of Partial Denture Design etc.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	4

Title/Name of qualification/component: Dental Laboratory Equipment Technician			Level:
4			
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
Professional skill	<ul style="list-style-type: none"> ● Explain and discuss repair & relining of denture. ● Make diagnostic and master casts, special trays and occlusal runs and articulates casts. ● Perform teeth setting. ● Plan and process the denture and also repair broken denture and reline the denture. ● Carve various maxillary anterior teeth, mandibular anterior teeth, maxillary premolar, mandibular premolar, maxillary molars and mandibular molars. ● Prepare appropriate retention features in removable partial dentures. ● Fabricate temporary acrylic jacket crowns. ● Fabricate copings and prepare die. ● Fabricate porcelain fused to metal crown. 	<p>The learning outcomes for example 'Perform teeth setting' and 'Plan and process the denture and also repair broken denture and reline the denture' require cognitive and practical skills to accomplish tasks that involve understanding requirements; then as per requirements deciding which operations/procedure/tools will achieve desired result; planning the sequence of operations to maximum effectiveness; constantly checking and reviewing plan etc., all of which involve problem solving and decision making.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	5
Core skill	<p>Understanding of social/political skill</p> <ul style="list-style-type: none"> ● Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth. 	<p>The learning outcomes for example 'Comply with environment regulation and housekeeping ', 'Interpret & use formal and technical communication' etc. display the learning outcomes where the learner needs to display</p>	4

Title/Name of qualification/component: Dental Laboratory Equipment Technician			Level:
4			
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
	<ul style="list-style-type: none"> Comply with environment regulation and housekeeping. <p>Organizing information and communication</p> <ul style="list-style-type: none"> Interpret & use formal and technical communication. 	<p>understanding of social, political skill and some skill of collecting and organizing information and communication.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	
Responsibility	<ul style="list-style-type: none"> Make diagnostic and master casts, special trays and occlusal runs and articulates casts. Perform teeth setting. Plan and process the denture and also repair broken denture and reline the denture. Fabricate temporary acrylic jacket crowns. Prepare various cast, die for fixed partial denture, full metal crown and full metal bridges. Fabricate copings and prepare die. Fabricate porcelain fused to metal crown. Manipulates and uses dental waxes and impression materials and uses dental based materials effectively. Fabricate temporary acrylic jacket crowns. 	<p>The role of Dental Laboratory Equipment Technician is independently responsible to perform the work as per specifications followed by analysis of what needs to be done based on their understanding of full or partial dentures, inlays, bridges, crowns of metal, selection of best Equipment and working processes, principles and standards etc. to achieve desired outcome and they have got some responsibility for other's works and learning as well as indicated in learning outcomes like 'Plan and process the denture and also repair broken denture and reline the denture', 'Fabricate temporary acrylic jacket crowns' etc.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	4

SECTION 3**EVIDENCE OF NEED**

26	<p>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?</p> <table border="1"> <thead> <tr> <th>Basis</th> <th>In case of other Awarding Bodies (Institutes under Central Ministries and states departments)</th> </tr> </thead> <tbody> <tr> <td>Need of the qualification</td> <td> <p>Healthcare 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 labour intensive and there are many emerging trends in this sector.</p> <p>Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.</p> </td> </tr> <tr> <td>Industry Relevance</td> <td> <p>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.</p> </td> </tr> <tr> <td>Usage of the qualification</td> <td> <p>The Proposed qualification will create skilled Technician for various establishments in Healthcare Sectors.</p> </td> </tr> <tr> <td>Estimated uptake</td> <td> <p>The present seating capacity is 2002.</p> </td> </tr> </tbody> </table>	Basis	In case of other Awarding Bodies (Institutes under Central Ministries and states departments)	Need of the qualification	<p>Healthcare 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 labour intensive and there are many emerging trends in this sector.</p> <p>Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.</p>	Industry Relevance	<p>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.</p>	Usage of the qualification	<p>The Proposed qualification will create skilled Technician for various establishments in Healthcare Sectors.</p>	Estimated uptake	<p>The present seating capacity is 2002.</p>
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Usage of the qualification	<p>The Proposed qualification will create skilled Technician for various establishments in Healthcare Sectors.</p>										
Estimated uptake	<p>The present seating capacity is 2002.</p>										
27	<p>Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences.</p> <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.</p>										

<p>28</p>	<p>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</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>
<p>29</p>	<p>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</p> <ul style="list-style-type: none"> • The research wing of CSTARI & DGT reviews and updates the qualification, in consultation with industries and other stakeholders, on a regular basis by conducting trade committee meetings. • DGT will monitor any duplicity by comparing existing qualifications with upcoming ones in the National Qualifications Register (NQR) and relevant sectors.

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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