

## **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.

### **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

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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 Skills (Employability Skills).**

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**e) SUMMARY**

<b>1</b>	<b>Qualification Title</b>	<b>'RADIOLOGY TECHNICIAN'</b>
<b>2</b>	<b>Qualification Code, if any</b>	<b>DGT/1059</b>
<b>3</b>	<b>NCO code and occupation</b>	3211.0101- Radiology Technician  3211.0100 - X-ray Technician
<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 Radiology Technician and will enable the trainee to perform diagnostic imaging examinations such as X-rays, CT and MRI scans under the guidance of a Radiologist.  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>	Radiology Technician X-ray Technician
<b>9</b>	<b>Job description of the occupation</b>	The individual takes X-ray skiagraph (Photographs) for diagnosis of ailments or gives ray treatment by operating X-ray equipment and exposing patients to the rays. Prepares or gets patients prepared by Nurse for ray exposure. Regulates duration and intensity of exposure by adjusting machines and exposing patients to rays as directed by the Radiologist. They are responsible for preparing patients and operating equipment for the test, besides keeping patient records and adjusting and maintaining equipment etc.

10	Licensing requirements	NOT REQUIRED																																
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>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></td> <td></td> <td></td> <td></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 <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
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	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	Passed 10th Class examination 14 years as on first day of academic session.																																

16	<b>Progression from the qualification (Please show Professional and academic progression)</b>	An Individual can proceed for:		
		Professional <ul style="list-style-type: none"> <li>● Radiology Technician</li> <li>● Senior radiology Technician</li> <li>● Supervisor</li> <li>● Manager</li> <li>● Entrepreneur</li> </ul>	Technical / Academic     ATS CITS	   Diploma/ Advance Diploma (Vocational)
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>	3Yrs. 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)	Apply atomic and nuclear physics concept of Rutherford Bohr Model and relate it to Thomson’s model of the atom following safety precautions. HSS/N9451	35	12	4
(ii)	Demonstrate Electromagnetic radiation, production of x-ray, construction of modern x-ray tube, and Interactions of x-ray with matter. HSS/N9452	65	18	4

(iii)	Identify the X-ray circuit and units, radiographic grid and beam restricting devices and operate the console panel. HSS/N9453	65	18	4
(iv)	Perform radiation protection and operate radiation measuring devices and understand Radio Therapy. HSS/N9454	65	18	4
(v)	Assemble General & radiographic anatomy, bones, joints and body systems using mannequins and skeletons. HSS/N9455	40	12	4
(vi)	Execute the radiographic and darkroom techniques, perform the radiographic film processing. HSS/N9456	120	30	4
(vii)	Demonstrate the Radiographic contrast media and perform the radiographic positioning and special procedures. HSS/N9457	450	132	4
(viii)	Analyze CT patient positioning, manipulate parameters associated with exposure and processing to produce a required image of desired quality. HSS/N9458	120	36	4
(ix)	Operate MRI scan and perform patient positioning, review protocols for MRI scanning. HSS/N9459	60	22	4
(x)	Analyze USG scans patient positioning, preparation, techniques, general care. HSS/N9460	60	22	4
(xi)	Analyze working of CR, DR and fluoroscopy system manipulate parameters associated with exposure and processing to produce a required image of desired quality. HSS/N9461	60	22	4

(xii)	Interpret the factors, tools and techniques affecting the radiographic image quality. HSS/N9462	60	22	4
(xiii)	Illustrate the general patient care in handling and preparation of patients during radiological examination. HSS/N9463	35	16	4
(xiv)	Select and plan the radiographic calibration and Tube rating charts. HSS/N9464	20	08	4
(xv)	Analyze the medical emergency conditions and demonstrate their remedy. HSS/N9465	60	22	4
(xvi)	Analyze Operation of radiotherapy units and understand the basics of Human radiobiology, effects of radiation, protection in radiotherapy. HSS/N9466	365	130	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	-		-
(x)	Entrepreneurship	-		-

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

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**SECTION 1**  
**ASSESSMENT**

21	<p><b>Body/Bodies which will carry out assessment:</b>          Controller of Examinations, DGT</p>
22	<p><b>How will RPL assessment be managed and who will carry it out?</b>          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</p>

	<p>government/local authorities / shops covered under 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>
23	<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:

Sl. No.	Type of assessment	Subject for the trade test	Marks (1 <sup>st</sup> Year)	Marks (2 <sup>nd</sup> Year)
1	Summative Assessment	Practical	250	250
2		Trade Theory	100	100
5		Employability Skills	50	50
6	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

	<p>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.</p> <p><b>Specific Arrangements for assessment:</b></p> <ul style="list-style-type: none"> <li>• Assessment is outcome-based.</li> <li>• There are formative and summative assessments in Theory and Practical.</li> <li>• Assessment is carried out in Trade theory, Trade Practical and Employability Skills.</li> <li>• 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 and entrepreneurship and team-work abilities of the trainee.</li> <li>• In addition to demonstration of theory and practical knowledge, trainees get a chance to present total personality.</li> </ul> <p><b>Quality assurance activities:</b></p> <p>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)

<b>Means of assessment</b>		
Assessment will be evidence based comprising the following for each Learning Outcome:		
<b>Serial No.</b>	<b>Terminal Competency</b>	<b>Maximum Weightage (%)</b>

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

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:**

<b>LEARNING OUTCOME (TRADE SPECIFIC)</b>	
<b>LEARNING OUTCOME</b>	<b>ASSESSMENT CRITERIA</b>
<b>FIRST YEAR</b>	
1. Apply atomic and nuclear physics concept of Rutherford Bohr Model and relate it to Thomson's model of the atom following safety precautions HSS/N9451	Identify the basic structure of atom and nuclei.
	Perform a presentation on atom.
	Determine the half-life & decay constant for various radioactive materials.
	Differentiate between the properties of alpha, beta, gamma particles and fusion & fission.
2. Demonstrate Electromagnetic radiation, production of x-ray, construction of modern x-ray tube, and Interactions of x-ray with matter. HSS/N9452	Identify the type of radiation based on the Order of wavelengths, frequencies, amplitude and energy.
	Determine the properties and production of x-rays.
	Recognize the parts of x-ray tube and their functions.
	Identify the types of interaction of x-ray with matter and their probability of occurrence.
3. Identify the X-ray circuit and units, radiographic grid and beam restricting devices and operate the console panel. HSS/N9453	Identify the parts of x-ray circuit and unit.
	Operate the parts of the control panel.
	Measure the major parameters responsible for the production of x-ray.
	Identify and use the beam restricting devices.
	Check and perform the use of grid devices.
	Select and choose the grid & the Bucky factor.
	Understand the public & occupational radiation protection.

<p>4. Perform radiation protection and operate radiation measuring devices and understand Radio Therapy. HSS/N9454</p>	Identify the radiation protection equipments.
	Measure the dose levels by using dissymmetric instruments.
	Check and calculate the accuracy of different radiation safety equipments.
	Compute the dose measurement and dose limits.
	Identify the type of therapy.
	Identify the various types of machines used in radiotherapy.
<p>5. Assemble General &amp; radiographic anatomy, bones, joints and body systems using mannequins and skeletons. HSS/N9455</p>	Identify the bones, joints, muscles and their types.
	Analyze the body positions, planes and movements.
	Identify the different body organs and cavities.
	Perform the general radiographic positioning.
	Perform and select the darkroom techniques.
<p>6. Execute the radiographic and darkroom techniques, perform the radiographic film processing. HSS/N9456</p>	Identify the types of x-ray film, screen and cassettes.
	Prepare the x-ray film processing chemicals.
	Perform the use of x-ray film, screen and cassettes.
	Execute the handling and storage of radiographic film, screen and cassettes.
<p>7. Demonstrate the Radiographic contrast media and perform the radiographic positioning and special procedures. HSS/N9457</p>	Identify the difference between ionic and non-ionic contrast media.
	Perform and select the contrast for appropriate examination and care during contrast injection.
	Perform the routine radiographic positioning.
	Select the correct radiographic technical factors and analyze the x-ray film for image quality.

	Perform the radiographic positioning of special patients.
	Perform the radiographic procedures with appropriate techniques, patient care and handling.
<b>SECOND YEAR</b>	
8. Analyze CT patient positioning, manipulate parameters associated with exposure and processing to produce a required image of desired quality. HSS/N9458	Perform the patient positioning correctly for a CT scan.
	Illustrate the use of contrast medium in CT.
	Operate CT console for selection of suitable technical factors and protocols.
	Illustrate the radiographic appearance of both normal and abnormal conditions.
9. Operate MRI scan and perform patient positioning, review protocols for MRI scanning. HSS/N9459	Perform the patient positioning correctly for MRI scan.
	Identify the use of contrast medium in MRI scan.
	Operate MRI console for selection of suitable technical factors and protocols.
	Illustrate the radiographic appearance of both normal and abnormal conditions.
	Plan general safety rules in MRI practice.
10. Analyze USG scan patient positioning, Preparation, techniques, general care. HSS/N9460	Understand the USG techniques.
	Illustrate the use of contrast medium in USG.
	Perform the patient positioning and preparation correctly for USG scan.
	Understand the USG Doppler techniques.
11. Analyze working of CR, DR and fluoroscopy system manipulate	Operate CR, DR and Fluoroscopy system.
	Illustrate the difference between the working of CR, DR and Fluoroscopy system.

parameters associated with exposure and processing to produce a required image of desired quality. HSS/N9461	Compare the technical factors in the operation of different digital modalities.
	Analyze the scanned images to determine image quality and clarity.
	Care and maintenance of CR, DR and Fluoroscopy system.
12. Interpret the factors, tools and techniques affecting the radiographic image quality. HSS/N9462	Understand radiographic quality, resolution, noise and speed.
	Differentiate between the geometric factors affecting radiographic quality.
	Analyze the subject factors affecting radiographic quality.
	Analyze the tool and technique available to create high quality films.
13. Illustrate the general patient care in handling and preparation of patients during radiological examination. HSS/N9463	Execute and schedule patient-load based on emergency or appointment priority.
	Perform documentation required for medical history, procedures.
	Understand how to manage a patient with contrast media.
	Understand care and handling of patients in special cases.
14. Select and plan the radiographic calibration and tube rating charts. HSS/N9464	Understand and sketch tube rating charts.
	Assess application of tube rating charts in radiology.
	Illustrate the radiographic calibration.
15. Analyze the emergency conditions and demonstrate their remedy. HSS/N9465	Plan and perform the first aid in required conditions.
	Perform & operate the BP machine.
	Calculate & analyze the heart rate.
	Select & perform the techniques of Bandage & dressings.

	Plan & perform the energy treatment, according to the conditions.
16. Analyze Operation of radiotherapy units and understand basic of human radiobiology, effects of radiation, protection in radiotherapy. HSS/N9466	Identify the types of biological effects.
	Identify the different types of radiotherapy units.
	Operate the radiotherapy units.
	Execute planning set up for radiotherapy examination.
	Perform shielding methods for radiotherapy.
	Understand working and construction of LINAC.
	Calculate relative biological effectiveness and LET.
	Execute the treatment planning.

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<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
<b>7. Diversity and Inclusion</b>	
	Exhibit how to behave, communicate and conduct oneself appropriately with all genders and PwD
	Discuss the POSH Act and its significance
<b>8. Financial and Legal Literacy</b>	
	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
<b>9. Essential Digital Skills</b>	
	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
<b>10. Entrepreneurship</b>	
	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

**SECTION 2**

**25. EVIDENCE OF LEVEL**

**OPTION A**

Title/Name of qualification/component: RADIOLOGY TECHNICIAN			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>Analyze CT patient positioning, manipulate parameters associated with exposure and processing to produce a required image of desired quality.</li> <li>Operate MRI scan and perform patient positioning, review protocols for MRI scanning.</li> <li>Analyze USG scans patient positioning, preparation, techniques, general care.</li> </ul>	<p>The learner requires to demonstrate well-developed skill for example ‘AnalyzeCT patient positioning, manipulate parameters associated with exposure and processing to produce a required image of desired quality.’ and ‘Operate MRI scan and perform patient positioning, review protocols for MRI scanning’ as indicated in the learning outcomes to achieve the tolerance levels and accuracy demanded as per the job. The learner requires applying clear choice of procedures in familiar context during execution of CT scan, MRI scan, USG scan and administering them under supervision of a radiologist.</p> <p>In all these learning outcomes the learner has to apply ones knowledge and decide what needs to be done to either meet the client’s requirement or</p>	4

Title/Name of qualification/component: RADIOLOGY TECHNICIAN			Level: 4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
		identify a fault and decide how to rectify it or plan as per requirements and resources available.  Hence NSQF Level is 4 for this descriptor.	
Professional knowledge	<b>Knowledge of facts in the field of work or study</b> <ul style="list-style-type: none"> <li>● General patient care.</li> <li>● First Aid:</li> <li>●</li> </ul> <b>Knowledge of Principles and general concepts in the field of work or study</b> <ul style="list-style-type: none"> <li>● CT-Scan: Principle, equipments, Generation, scan parameters.</li> <li>● Computed Radiography</li> </ul>	The learner requires to demonstrate knowledge of facts, principles, processes and general concepts, in a field of Radiology i.e X-Ray, MRI, USG, CT-Scan, Fluoroscopy etc. He/she is expected to possess knowledge about the radiotherapeutic practices like Teletherapy calculations, planning procedures, Treatment techniques etc.; Radiotherapy treatment machines like Telecobalt units, Linear accelerators, Brachy therapy units, Simulator, TPS etc.	4

<b>Title/Name of qualification/component: RADIOLOGY TECHNICIAN</b>			<b>Level: 4</b>
<b>NSQF Domain</b>	<b>Outcomes of the Qualification/Component</b>	<b>How the outcomes relate to the NSQF level descriptors</b>	<b>NSQF Level</b>
	<p><b>Knowledge of processes in the field of work or study</b></p> <ul style="list-style-type: none"> <li>• Radiotherapy.</li> <li>• Radiotherapy treatment machines:</li> </ul>	<p>The learner requires demonstrating knowledge of principle in the concept of Nuclear Radiation, Human Anatomy, Nuclear Medicine and Radiotherapy.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	
Professional skill	<ul style="list-style-type: none"> <li>• Analyze working of CR, DR and fluoroscopy system manipulate parameters associated with exposure and processing to produce a required image of desired quality.</li> <li>• Interpret the factors, tools and techniques affecting the radiographic image quality.</li> <li>• Illustrate the general patient care in handling and preparation of patients during radiological examination.</li> </ul>	<p>The learning outcomes for example 'Interpret the factors, tools and techniques affecting the radiographic image quality.' and 'Illustrate the general patient care in handling and preparation of patients during.' requires 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 , all of which involve problem solving and decision making.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	4
Core skill	<b>Desired Mathematical Skills</b>	<p>The learning outcomes for example 'Explain personnel finance, entrepreneurship and</p>	4

Title/Name of qualification/component: RADIOLOGY TECHNICIAN			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>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><b>Organizing information and communication</b></p> <ul style="list-style-type: none"> <li>Interpret &amp; use formal and technical communication.</li> </ul>	<p>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> <p>Hence NSQF Level is 4 for this descriptor.</p>	
Responsibility	<ul style="list-style-type: none"> <li>Select and plan the radiographic calibration and Tube rating charts.</li> <li>Analyze the emergency conditions and demonstrate their remedy.</li> <li>Assemble General &amp; radiographic anatomy, bones, joints and body systems using mannequins and skeletons.</li> </ul>	<p>The role of Radiology 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 Atomic and Nuclear Physics, use of Various Radiology Equipments and their effect on Human Body, selection of best Equipment, setting parameters and working processes, principles and standards to achieve desired outcome.</p>	4

<b>Title/Name of qualification/component: RADIOLOGY TECHNICIAN</b>			<b>Level: 4</b>
<b>NSQF Domain</b>	<b>Outcomes of the Qualification/Component</b>	<b>How the outcomes relate to the NSQF level descriptors</b>	<b>NSQF Level</b>
		<p>Thus, the learner is responsible for own work and learning, as well as takes some responsibility of other's work and learning.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	

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**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="355 548 1404 1697"> <thead> <tr> <th data-bbox="355 548 643 689"><b>Basis</b></th> <th data-bbox="643 548 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"> <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 labor 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 data-bbox="355 1070 643 1496">Industry Relevance</td> <td data-bbox="643 1070 1404 1496"> <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 data-bbox="355 1496 643 1624">Usage of the qualification</td> <td data-bbox="643 1496 1404 1624"> <p>The Proposed qualification will create skilled Technician for various establishments in different Sectors.</p> </td> </tr> <tr> <td data-bbox="355 1624 643 1697">Estimated uptake</td> <td data-bbox="643 1624 1404 1697"> <p>The present seating capacity is 945.</p> </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	<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 labor 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 different Sectors.</p>	Estimated uptake	<p>The present seating capacity is 945.</p>
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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[Radiology Technician] --> B[Senior Radiology Technician]
      B --> C[Supervisor]
      C --> D[Manager]
      B --> E[Entrepreneur]
  
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