Qualification Code
QG-03-IT-00078-2023-V1-NASSCOM

CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE

Name and address of submitting body:

IT-ITeS Sector Skills Council NASSCOM (SSC NASSCOM)
Plot No. – 7, 8, 9 & 10
Sector – 126, Noida
Uttar Pradesh - 201303

Name and contact details of individual dealing with the submission

Name: Snehasis Bagchi

Position in the organisation: Lead, Standards Development

Address if different from above: Same as above

Tel number(s): Board No: 0120 4990111

E-mail address: snehasis@nasscom.in

List of documents submitted in support of the Qualifications File

1. Functional Analysis Document
2. Occupational Analysis Document
3. Qualification File
4. Occupational Map
5. Model Curriculum
6. Summary Sheet
7. Industry Validations

SUMMARY

1	**Qualification Title**	Software Developer Associate
2	**Qualification Code if any**	SSC/Q0511
3	**NCO code and occupation**	NCO-2015/ 2512.0204
4	**Nature and purpose of the qualification (Please specify whether qualification is short term or long term)**	- This qualification File (QF) containing National Occupational Standards for the job role "Software Developer Associate". - The purpose of the qualification is to help individuals perform different aspects of software development. This Qualification will equip him/her with the appropriate development skills, attention to detail and problem-solving ability required for the role.
5	**Body/bodies which will award the qualification**	SSC NASSCOM
6	**Body which will accredit providers to offer courses leading to the qualification**	IT-ITeS SSC Presently, Accreditation is not prescribed; affiliation is one of the models.
7	**Whether accreditation/ affiliation norms are already in place or not, if applicable (if yes, attach a copy)**	Yes. SMART norms for accreditation and SSC norms are available for affiliation on SMART portals
8	**Occupation(s) to which the qualification gives access**	Application Development
9	**Job description of the occupation**	This unit is about contributing to the design of software products and applications where both the business impact and technical complexity are low.
10	**Licensing requirements**	NA
11	**Statutory and Regulatory requirement of the relevant sector (documentary evidence to be provided)**	Yes
12	**Level of the qualification in the NSQF**	Level-3
13	**Anticipated volume of training/learning required to complete the qualification**	210 hours (78 hours theory, 132 hours practical)
14	**Indicative list of training tools required to deliver this qualification**	• PCs/Laptops • Internet with Wi-Fi (Min 2 Mbps Dedicated) • Microphone / voice system for lecture and class activities

		• Computer Lab with 1:1 PC: trainee ratio and having internet connection, MS Office / Open office, Browser, Outlook / Any other Email Client, and chat tools		
15	**Entry requirements and/or recommendations and minimum age**	12th grade pass OR 10th Grade Pass with 2 years of relevant experience* OR NSQF Level 2 with 3-year relevant experience* *Relevant Experience: Computer Operation		
16	**Progression from the qualification (Please show Professional and academic progression)**	This entry should refer to one or more of the following: - access to other qualifications at the same NSQF level – Engineer trainee to enter software development and UI developer. In software developer- Sr. functional developer, Senior Software Developer, Team Leader / Application Architect / Web Solution Developer etc		
17	**Arrangements for the Recognition of Prior learning (RPL)**	- Response to market forces for RPL. - RPL assessments will be the same as our normal assessments.		
18	**International comparability where known (research evidence to be provided)**	Not Yet Established		
19	**Date of planned review of the qualification**	15-08-2023		

	Formal structure of the qualification Mandatory components			
	Title of component and identification code/NOSs /Learning outcomes	**Mandatory/ Optional**	**Estimated size (Learning Hours)**	**Level**
(i)	**SSC/N0502 Develop software code to specification**	**Mandatory**	150	03
(ii)	**DGT/VSQ/N0102 Employability Skill (60 Hours)**	**Mandatory**	60	04
	Total		210	---

SECTION 1
ASSESSMENT

21	**Body/Bodies which will carry out assessment:**
	SSC NASSCOM will carry out the assessment along with the assessment partners.
22	**How will RPL assessment be managed and who will carry it out?**
	• *RPL assessment will be online, objective evaluation in a highly secure and proctored environment.*
	• *RPL assessments will be the same as our normal assessments.*
	• *All procedures followed will be similar to the normal assessment methodology.*
	• *Issuance of the qualification will be through the centralise SDMS (NSDC).*
	• *Quality assurance – By equating performance amongst the multiple affiliated assessment provider (AAP) and periodic analytical review and sensitivity analysis for the reliability and validity of all aspects of assessments.*
23	**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.**
	• *SSC NASSCOM carries out online assessments through very robust platforms and proctoring methodology.*
	• *Conduct of assessment are through trained and certified proctors under the assessment agency, partnering with SSC NASSCOM*
	• *AAP affiliated to SSC NASSCOM come with strong industry references and long experience and analytical ability in assessment methodologies.*
	• *Periodic workshops are held with the vendors to bring them to a common understanding of the job role, its NSQF level, difficulty level as well as format and sample of assessment items.*
	• *Internal moderations further ensure the validity and reliability of the assessments and consistency of difficulty levels of the test questions across AAPs.*
	• *AAPs work with hirers on similar job roles, they use SMEs from their network to get industry relevant scenarios and assessment items aligned to the expected outcomes of the job role/QF.*
	• *Curriculum and real time scenarios facilitate further understanding the scope of the QF with reference to process knowledge and skills.*
	• *In addition, we conduct workshops with AAPs w.r.t. beta testing, review of the assessment analytics, performance of the test platform,*

	moderation of NSQF levels, deployment and invigilation patterns and infrastructure requirements including malpractice avoidance.
	• *Inferences from benchmarking and analytics patterns are taken into consideration in the development and revision of the assessment criteria and format of assessment items.*
	• *Reliability and validity of assessment items is standardised among AAPs.*
	• *Difficulty level of test items with reference to NSQF levels are ensured, so that the outcomes with reference to performance criteria of the constituent NOSs are in line with the NSQF level descriptors. This is achieved through the detailed test matrix design.*

Please attach most relevant and recent documents giving further information about assessment and/or RPL.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

ASSESSMENT EVIDENCE

Complete a grid for each component as listed in "Formal structure of the qualification" in the Summary.

NOTE: this grid can be replaced by any part of the qualification documentation which shows the same information – i.e., Learning Outcomes to be assessed, assessment criteria and the means of assessment.

24. Assessment Evidence
Title of Component:

Job Role	Software Developer Associate
Qualification File	SSC/Q0511
Sector Skill Council	IT-ITeS

Guidelines for Assessment:

1. Criteria for assessment for each Qualification File will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective / option NOS/set of NOS
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion
6. To pass a QF, a trainee should score a minimum aggregate of 50% across qualification.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification File.

Title of NOS/Unit/Component

Outcomes to be assessed/NOSs to be assessed	Assessment criteria for the outcome	Total Marks	Out of	Theory	Skills Practical
SSC/N0502: Develop software code to specification	**PC1.** evaluate understanding of Business Requirements Specification (BRS), Software Requirements Specification (SRS), High Level Design (HLD) and Low-Level Design (LLD)	**100**	5	5	-
	PC2. access reusable components, code		10	-	10

	generation tools and unit testing tools from the organization's knowledge base				
	PC3. convert technical specifications into code to meet the requirements, leveraging reusable components, where available		10	-	10
	PC4. create appropriate unit test cases (UTCs)		10	-	10
	PC5. review codes and UTCs with supervisors		5	5	-
	PC6. execute UTCs and document results		10	-	10
	PC7. rework the code and UTCs to fix identified defects		10	-	10
	PC8. analyse inputs from line managers and implement the same for future designs		5	5	-
	PC9. record corrective actions for identified defects to inform future designs		10	-	10
	PC10. submit tested code for approval to experts		5	5	-
	PC11. update organization's knowledge base with the experiences of the code developed		10	-	10
	PC12. comply with organizational policies, procedures and guidelines when developing software code to specification		10	-	10
		Total	**100**	**20**	**80**

DGT/VSQ/N0102 Employability Skill (60 Hours)	PC1. Introduction to Employability Skills	50	2	1	1
	PC2. Constitutional values – Citizenship		2	1	1
	PC3. Becoming a Professional in the 21st Century		6	2	4
	PC4. Basic English Skills		6	2	3
	PC5. Career Development & Goal Setting		3	1	2
	PC6. Communication Skills		4	2	2
	PC7. Diversity & Inclusion		2	1	2
	PC8. Financial and Legal Literacy		5	2	3
	PC9. Essential Digital Skills		8	3	4
	PC10. Entrepreneurship		4	2	3
	PC11. Customer Service		3	1	2
	PC12. Getting Ready for Apprenticeship & Jobs		5	2	3
	Total		**50**	**20**	**30**

Means of assessment 1 Proctored online assessments (LAN and Web based), carried out using a variety of question formats applicable for linear / adaptive methodologies; performance criteria being assessed via situation judgement tests, simulations, code writing, psychometrics, and multiple-choice questions etc
Means of assessment 2 NA

SECTION 2
25. EVIDENCE OF LEVEL

Title/Name of qualification/component: Software Developer Associate		Level: 3	
NSQF Domain	**Key requirements of the job role**	**How the job role relates to the NSQF level descriptors**	**NSQF Level**
Process	- Contribute to the design of software products and application - Develop software code to specification - Manage your work to meet requirements - Work effectively with colleagues - Maintain a healthy, safe, and secure working environment - Provide data/information in standard formats - Maintain an inclusive, environmentally sustainable workplace	Individual at this job requires a well-developed skill, to contribute to the design of software products and applications & develop software code to specification. Individuals at this job are responsible for development of software applications and interfaces as well as enhancements to existing packaged applications or pre-engineered templates. The job also involves providing support to custom applications, debugging, maintenance and documentation.	3

Title/Name of qualification/component: Software Developer Associate		Level: 3	
NSQF Domain	**Key requirements of the job role**	**How the job role relates to the NSQF level descriptors**	**NSQF Level**
Professional knowledge	• Standard operating procedures of the organization's policies, procedures, and guidelines for creating documents for knowledge sharing • How to access and update organization's knowledge base • The purpose and scope of the work to be carried out and the importance of keeping within these boundaries • The importance of receiving, collating, analyzing, and implementing feedback on the work output KU5. standard templates and tools available and how to use these to document the designs • The approval process for designs of software products and applications • How to design basic program structures, software products and software applications • Different sources of information to help design software products and specifications • Common design defects and how to resolve these • Current practice in the infrastructure design of software products and applications	Individuals at this job need to have factual and theoretical knowledge context of the field of work, to contribute to the design of software products and applications& develop software code to specification. He/she needs to know & understand: • how to interpret and follow different design specifications, including Business Requirements Specification (BRS), User Requirements Specification (URS), Software Requirements Specification (SRS) & High-Level Design (HLD)	3

Title/Name of qualification/component: Software Developer Associate		Level: 3
NSQF Domain	**Key requirements of the job role**	**How the job role relates to the NSQF level descriptors**	**NSQF Level**
	• The range of activities involved in designing different software products and applications • How to test new products and applications are fit for purpose • Implications new products and applications may have on business processes and business infrastructure • The scope of work to be executed and the importance of keeping within the level of own competency and authority • The importance of collating feedback on coding and UTCs • How to analyse and use feedback to improve coding and UTCs • Whom to be involved to provide feedback on the coding and UTCs • Organization's approval process for software code designs • The process for converting technical specifications into code • Current practice in the infrastructure design of software code • How to write software code that is efficient, readable, and maintainable • How to use the range of code generation tools and unit testing tools for developing software code • How to create, review and execute UTCs	• how to design basic program structures, software products & software applications	

Title/Name of qualification/component: Software Developer Associate		Level: 3	
NSQF Domain	**Key requirements of the job role**	**How the job role relates to the NSQF level descriptors**	**NSQF Level**
	• How to determine whether components are suitable for re-use • Different types of problems and defects that may occur during coding and their solution • How recording corrective actions for problems and defects can improve future designs • How to test and debug new software code • Different sources of information for help to write software code		
Professional skill	• Produce work output in prescribed format with accurate details • Draw a conclusive plan to complete the tasks within given deadlines • Apply problem-solving approaches in different situation • Configure data and disseminate relevant information and constructive opinions, applying balanced judgments to different situations • Practice utilizing information technology efficiently to insert or extract data accurately • The importance of collating feedback on coding and UTCs • How to analyse and use feedback to improve coding and UTCs	Individuals at this job need to have cognitive and practical skills required for development of software applications and interfaces as well as enhancements to existing packaged applications or pre-engineered templates. He/she needs to know & understand:	3

Title/Name of qualification/component: Software Developer Associate		Level: 3	
NSQF Domain	**Key requirements of the job role**	**How the job role relates to the NSQF level descriptors**	**NSQF Level**
	- Whom to be involved to provide feedback on the coding and UTCs - Organization's approval process for software code designs - The process for converting technical specifications into code - Current practice in the infrastructure design of software code - How to write software code that is efficient, readable, and maintainable - How to use the range of code generation tools and unit testing tools for developing software code - How to create, review and execute UTCs - How to determine whether components are suitable for re-use - Different types of problems and defects that may occur during coding and their solution - How recording corrective actions for problems and defects can improve future designs - How to test and debug new software code - Different sources of information for help to write software code	- organization's policies, procedures, and guidelines for designing software products and applications - the scope of work to be carried out and the importance of keeping within these boundaries - the importance of collating feedback on your coding and UTC's - how to analyse and use feedback to improve your coding and UTCs - who you may need to involve providing feedback on your coding and UTC's organization's approval	

Title/Name of qualification/component: Software Developer Associate		Level: 3	
NSQF Domain	**Key requirements of the job role**	**How the job role relates to the NSQF level descriptors**	**NSQF Level**
		process for software code designs	
Core skill	• Listen actively and communicate with others orally and in writing • Work in a customer facing environment with peers to build and maintain positive and effective relationships with customers to meet their requirements	Individuals at this job should have mathematical skills to plan and organize work to achieve targets and deadlines. He/she needs to apply problem solving approaches in different situations & make decisions on suitable course of action The individual should be result oriented. The individual should also be able to demonstrate skills for communication and logical thinking. The core & generic job skills to collecting and organising	3

Title/Name of qualification/component: Software Developer Associate		Level: 3	
NSQF Domain	**Key requirements of the job role**	**How the job role relates to the NSQF level descriptors**	**NSQF Level**
		information, communication that an individual should have, will help him/her understand & manage assigned works in the context of the social environment of the customer	
Responsibility	• Functional and non-functional software requirements • Selection of technical solution of software related issues and backing rationales through proper usage of High-Level Design (HLD) • Seek guidance and advice from peers or supervisors • Requirements to prepare High Level Design (HLD) • Checklists for coding standards of programming structure	Individuals at this job are responsible for development of software applications and interfaces as well as enhancements to existing packaged applications or pre-engineered templates. The job also involves providing support to custom applications, debugging, maintenance and documentation.	3

Title/Name of qualification/component: Software Developer Associate		Level: 3	
NSQF Domain	**Key requirements of the job role**	**How the job role relates to the NSQF level descriptors**	**NSQF Level**
		This job requires the individual to work independently and be comfortable in making decisions pertaining to his/her area of work. These tasks will require the individual to take responsibility of his/her own work and learning.	

SECTION 3

EVIDENCE OF NEED

26	What evidence is there that the qualification is needed?
	While collecting data from the companies for the occupational map, we also took feedback from industry, training institutions which was collected with respect to roles for which qualification files development, was to be prioritized. This was largely based on volume of people required, quantitative and qualitative shortfall which the industry feels they face. Governing council of IT - ITeS and Occupational Standards Committee which comprises of experts & senior leaders gave final approval and endorsement for the same.
	The Indian IT industry's revenue is estimated to reach US$ 194 billion in FY21, an increase of 2.3% YoY. The sector is the largest employer within the private sector. According to Gartner estimates, IT spending in India is estimated to reach US$ 93 billion in 2021 (7.3% YoY growth) and further increase to US$ 98.5 billion in 2022.
	The IT industry accounted for 8% of India's GDP in 2020. Exports from the Indian IT industry are expected to increase by 1.9% to reach US$ 150 billion in FY21. In 2020, the IT industry recorded 138,000 new hires. According to STPI (Software Technology Park of India), the software exports by its registered units increased by 7% YoY to reach Rs. 5 lakh crore (US$ 67.40 billion) in FY21 from Rs. 4.66 lakh crore (US$ 62.82 billion) in FY20, driven by rapid digitization and the IT industry's timely transition to remote working environments that helped to keep up the industry's growth amid coronavirus pandemic.
	In Budget 2021, the government has allocated Rs. 53,108 crore (US$ 7.31 billion) to the IT and telecom sector
	In India there are 421 approved SEZs across the country, with 276 of them from IT & BPM and 145 as exporting SEZs. The IT & BPM industry's revenue is estimated at ~US$ 194 billion in FY21, an increase of 2.3% YoY. The domestic revenue of the IT industry is estimated at US$ 45 billion and export revenue is estimated at US$ 150 billion in FY21.
27	What is the estimated uptake of this qualification and what is the basis of this estimate?
	Overview of the occupational demand, that includes 'Software Developer Associate', is available in the talent demand supply document. NASSCOM's Strategic Review, 2020 articulates 2.40 lakh as new hires for the IT-BPM industry.

		Through training providers', the requirement is estimated as 1000 for FY 19-20
28		**What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF?** It is available on public view for more than a year and has not been contested till date. As the understanding and adoption models of QFs evolve in the industry and across its sub-sectors, we foresee consolidation of qualification files as a natural progression.
29		**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?** • *Monitoring and review of the qualifications is a project executed every Six Months. Presently, the research project is scheduled to take off.* • *While adoption by industry and academia is one good indicator for the usefulness of a qualification file, we adopt multiple approaches for periodic review and maintenance of the qualifications.* 1. *Sub-sector wise Industry council headed by council chair is a formal part of our governing structure. The council participates and steers the qualifications creation and upkeep. This council is a body elected by over 2800 member companies of NASSCOM.* 2. *Special interest groups are formed for a more focused and detailed review of the qualifications in the light of emerging knowledge and skill areas.* 3. *Events and workshops are conducted periodically to validate, monitor, and review the qualification as a part of due diligence process for affiliating Training providers, we do ask them for validation from their hirers – thus covering even medium, small and micro segment of the hiring companies. Any institution / individual is welcome to send feedback, which is recorded and considered during next review cycle.* The above data is used to update the Qualification and this revision is published annually. Nonetheless, if major feedback is received prior to the planned review period, the change is considered in consultation with the industry council.

Please attach any documents giving further information about any of the topics above.

Give details of the document(s) here: Occupation analysis report for IT Services Sub-sector (attachment sl no. 2)

SECTION 4

EVIDENCE OF RECOGNITION OR PROGRESSION

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?

This qualification has been through workshops and consultations.

Adequate NOSs / performance criteria have been added to ensure progression to related pathways identified as per the occupational career map.

Occupational Map-IT Services