



# **COMPETENCY STANDARD FOR SOFTWARE QUALITY ASSURANCE**

**Level: 3**

**(ICT Sector)**

**Competency Standard Code: CS-ICT-SQA-L3-EN-V1**



**National Skills Development Authority  
Chief Adviser's Office  
Government of the People's Republic of Bangladesh**



## Copyright

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This Competency Standard for Software Quality Assurance is a document for the development of curricula, teaching and learning materials, and assessment tools. It also serves as the document for providing training consistent with the requirements of industry in order to meet the qualification of individuals who graduated through the established standard via competency-based assessment for a relevant job.

This document has been developed by NSDA in association with ICT Sector, industry representatives, academia, related specialist, trainer and related employee.

Public and private institutions may use the information contained in this standard for activities benefitting Bangladesh.



## Introduction

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The NSDA aims to enhance an individual's employability by certifying completeness with skills. NSDA works to expand the skilling capacity of identified public and private training providers qualitatively and quantitatively. It also aims to establish and operationalize a responsive skills ecosystem and delivery mechanism through a combination of well-defined set of mechanisms and necessary technical supports.

Key priority economic growth sectors identified by the government have been targeted by NSDA to improve current job skills along with existing workforce to ensure required skills to industry standards. Training providers are encouraged and supported to work with industry to address identified skills and knowledge to enable industry growth and increased employment through the provision of market responsive inclusive skills training program. "**Software Quality Assurance**" is selected as one of the priority occupations of ICT Sector. This standard is developed to adopt a demand driven approach to training with effective inputs from Industry Skills Councils (ISC's), employer associations and employers.

Generally, a competency standard informs curriculum, learning materials, assessment and certification of trainees enrolled in Skills Training. Trainees who successfully pass the assessment will receive a qualification in the National Skills Qualification Framework (NSQF) under Bangladesh National Qualification Framework and will be listed on the NSDA's online portal.

This competency standard is developed to improve skills and knowledge in accordance with the job roles, duties and tasks of the occupation and ensure that the required skills and knowledge are aligned to industry requirements. A series of stakeholder consultations, workshops were held to develop this document.

The document also details the format, sequencing, wording and layout of the Competency Standard for an occupation which is comprised of Units of Competence and its corresponding Elements.



## Overview

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A competency standard is a written specification of the knowledge, skills and attitudes required for the performance of an occupation, trade or job corresponding to the industry standard of performance required in the workplace.

The purpose of a competency standards is to:

- provide a consistent and reliable set of components for training, recognising and assessing people's skills, and may also have optional support materials
- enable industry recognised qualifications to be awarded through direct assessment of workplace competencies
- encourage the development and delivery of flexible training which suits individual and industry requirements
- encourage learning and assessment in a work-related environment which leads to verifiable workplace outcomes

Competency standards are developed by a working group comprised of representative from NSDA, Key Institutions, ISC, and industry experts to identify the competencies required of an occupation in ICT Sector.

Competency standards describe the skills, knowledge and attitude needed to perform effectively in the workplace. CS acknowledge that people can achieve technical and vocational competency in many ways by emphasizing what the learner can do, not how or where they learned to do it.

With competency standards, training and assessment may be conducted at the workplace or at training institute or any combination of these.

Competency standards consist of a number of units of competency. A unit of competency describes a distinct work activity that would normally be undertaken by one person in accordance with industry standards.

Units of competency are documented in a standard format that comprises of:

- unit title
- nominal duration
- unit code
- unit descriptor
- elements and performance criteria
- variables and range statement
- curricular content guide
- assessment evidence guide

Together, all the parts of a unit of competency:

- describe a work activity
- guide the assessor to determine whether the candidate is competent or not yet competent

The ensuing sections of this document comprise of a description of the relevant occupation, trade or job with all the key components of a unit of competency, including:

- a chart with an overview of all Units of Competency for the relevant occupation, trade or job including the Unit Codes and the Unit of Competency titles and corresponding Elements
- the Competency Standard that includes the Unit of Competency, Unit Descriptor, Elements and Performance Criteria, Range of Variables, Curricular Content Guide and Assessment Evidence Guide.



## Competency Standards for National Skill Certificate, Level-3 in Software Quality Assurance in ICT Sector

### Level Descriptors of BNQF 1-6

Level & Job classification	Knowledge Domain	Skills Domain	Responsibility Domain
6-Mid-Level Manager/ Sub Assistant Engineer	Comprehensive actual and theoretical knowledge within a specific work or study area with an awareness of the validity and limits of that knowledge, able to analyse, compare, relate and evaluate.	Specialised and wider range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems. Communicate professional issues and solutions to the team and to external partners/users.	Work under broad guidance and self-motivation to execute strategic and operational plan/s. Lead lower-level management. Diagnose and resolve problems within and among work groups.
5-Supervisor	Broad knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to scrutinize and break information into parts by identifying motives or causes.	Broad range of cognitive and practical skills required to generate solutions to specific problems in one or more work or study areas. Communicate practice-related problems and possible solutions to external partners.	Work under guidance of management and self-direction to resolve specific issues. Lead and take responsibility for the work and actions of group/team members. Bridge between management.
4-Highly Skilled Worker	Broader knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to solve problems to new situations by comparing and applying acquired knowledge.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying the full range of methods, tools, materials and information. Communicate using technical terminology and IT technology with partners and users as per workplace requirements.	Work under minimal supervision in specific contexts in response to workplace requirements. Resolve technical issues in response to workplace requirements and lead/guide a team/ group.
3-Skilled Worker	Moderately broad knowledge in a specific work or study area, able to perceive ideas and abstract from drawing and design according to workplace requirements.	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools. Communicate with his team and limited external partners upholding the values, nature and culture of the workplace	Work or study under supervision with considerable autonomy. Participate in teams and responsible for group coordination.
2-Semi Skilled Worker	Basic understanding of underpinning knowledge in a specific work or study area, able to interpret and apply common occupational terms and instructions.	Skills required to carry out simple tasks, communicate with his team in the workplace presenting and discussing results of his work with required clarity.	Work or study under supervision in a structured context with limited scope of manipulation
1 –Basic Skilled Worker	Elementary understanding of ability to interpret the underpinning knowledge in a specific study area, able to interpret common occupational terms and instructions.	Specific Basic skills required to carry out simple tasks. Interpret occupational terms and present the results of own work within guided work environment/ under supervision.	Work under direct supervision in a structured context with limited range of responsibilities.



## List of Abbreviations

CS	Competency Standard
ISC	Industry Skills Council
NSDA	National Skills Development Authority
NSQF	National Skills Qualifications Framework
OSH	Occupational Safety and Health
PPE	Personal Protective Equipment
SCVC	Standards and Curriculum Validation Committee
STP	Skills Training Provider
SOP	Standard Operating Procedure
UoC	Unit of Competency
SQA	Software Quality Assurance
QA	Quality Assurance
QC	Quality Control
UAT	User Acceptance Testing
OOP	Object-Oriented Programming
CI	Continuous Integration
CD	Continuous Deployment
VCS	Version Control System
RBAC	Role-Based Access Control
KPI	Key Performance Indicators
OWASP	Open Worldwide Application Security Project



# **Approval of Competency Standard**

Approved by

44<sup>th</sup> Authority Meeting of NSDA

Held on 18.06.2025

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**Competency Standards for National Skill Certificate, Level-3 in  
Software Quality Assurance in ICT Sector**

**Course Structure**

<b>SL No</b>	<b>Unit code and Title</b>	<b>UOC Level</b>	<b>Nominal (hours)</b>	
<b>Generic Units of Competencies</b>				
1.	GU-02-L2-V1	Carryout workplace interaction in English	2	15
2.	GU-04-L1-V1	Work in a team environment	1	20
<b>Sub Total</b>			<b>35</b>	
<b>Sector Specific Units of Competencies</b>				
1.	OU-ICT-05-L3-V1	Use Internet and Access Resources	3	30
2.	SU-ICT-06-L3-V1	Comply to ethical standards in IT workplace	3	15
3.	SU-ICT-12-L3-V1	Manage Online Marketplace for Freelancing	3	15
<b>Sub Total</b>			<b>60</b>	
<b>Occupation Specific Units of Competencies</b>				
4.	OU-ICT-SQA-01-L3-V1	Interpret Software Quality Assurance (SQA)	3	30
5.	OU-ICT-SQA-02-L3-V1	Perform Manual Testing	3	80
6.	OU-ICT-SQA-03-L3-V1	Perform Automation Testing	3	75
7.	OU-ICT-SQA-05-L3-EN-V1	Perform fundamental API Testing	3	30
8.	OU-ICT-SQA-06-L3-V1	Perform Fundamental Load and Performance Testing	3	30
<b>Sub Total</b>			<b>245</b>	
<b>Workplace visit</b>			<b>20</b>	
<b>Total Duration</b>			<b>360</b>	

## Units & Elements at Glance

### Generic Competencies

<b>Code</b>	<b>Unit of competency</b>	<b>Elements of competency</b>	<b>Duration (hours)</b>
GU-02-L2-V1	Carryout workplace interaction in English	<ol style="list-style-type: none"><li>1. Interpret workplace communication and etiquette</li><li>2. Read and understand workplace documents</li><li>3. Participate in workplace meetings and discussions</li><li>4. Practice professional ethics at workplace</li></ol>	15
GU-08-L2-V1	Work in a team environment	<ol style="list-style-type: none"><li>1. Identify team goals and processes</li><li>2. Communicate and cooperate with team members</li><li>3. Work as a team member</li><li>4. Solve problems as a team member</li></ol>	20
<b>Total hours</b>			<b>35</b>

## Sector specific competencies

<b>Code</b>	<b>Unit of competency</b>	<b>Elements of competency</b>	<b>Duration (hours)</b>
OU-ICT-05-L3-V1	Use Internet and Access Resources	<ol style="list-style-type: none"> <li>1. Prepare resources for sharing</li> <li>2. Access Resources using the Internet</li> <li>3. Use e-mail</li> </ol>	30
SU-ICT-06-L3-V1	Comply to Ethical Standards in IT Workplace	<ol style="list-style-type: none"> <li>1. Uphold the requirements of clients</li> <li>2. Deliver quality products and services</li> <li>3. Maintain professionalism at workplace</li> <li>4. Maintain workplace code of conduct</li> </ol>	15
SU-ICT-12-L3-V1	Manage Online Marketplace for Freelancing	<ol style="list-style-type: none"> <li>1. Establish Presence on Online Marketplaces</li> <li>2. Create a Professional Profile</li> <li>3. Identify and Bid on Projects</li> <li>4. Deliver Quality Work</li> <li>5. Maintain Client Relationships</li> </ol>	15
<b>Total hours</b>			<b>60</b>

## Occupation specific competencies

Code	Unit of competency	Elements of competency	Duration (hours)
OU-ICT-SQA-01-L3-V1	Interpret Software Quality Assurance (SQA)	<ol style="list-style-type: none"> <li>1. Explain Software Quality Assurance (SQA) fundamental &amp; Quality Assurance (QA) Process</li> <li>2. Describe roles and responsibilities in Software Quality Assurance</li> <li>3. Identify Software Development Lifecycle and Integration with QA Process</li> <li>4. Categorize Software Testing types, Principles &amp; Best Practices</li> </ol>	30
OU-ICT-SQA-02-L3-V1	Perform Manual Testing	<ol style="list-style-type: none"> <li>1. Analyze Software Requirements</li> <li>2. Develop Test Strategy and Plan</li> <li>3. Design Test Scenarios and Cases</li> <li>4. Perform Test execution and Identify Defects/Bugs</li> <li>5. Document and Report Testing Results</li> <li>6. Conduct UAT &amp; Complete Testing Activities</li> </ol>	80
OU-ICT-SQA-03-L3-V1	Perform Automation Testing	<ol style="list-style-type: none"> <li>1. Identify Software Programming Syntax and Languages</li> <li>2. Apply tools and frameworks for Automation</li> <li>3. Implement Object-Oriented Programming (OOP)</li> <li>4. Develop Automation Scripts and Framework</li> <li>5. Generate Automation Test Reports</li> </ol>	75
OU-ICT-SQA-05-L3-V1	Perform fundamental API Testing	<ol style="list-style-type: none"> <li>1. Analyze API Requirements</li> <li>2. Develop API Test Strategies</li> <li>3. Install and Configure API Testing Tools</li> <li>4. Develop and Implement API Test Cases</li> <li>5. Execute Tests and Generate Reports</li> </ol>	30
OU-ICT-SQA-06-L3-V1	Perform Fundamental Load and Performance Testing	<ol style="list-style-type: none"> <li>1. Set Up Testing Environment</li> <li>2. Define Testing Criteria &amp; Establish baseline</li> <li>3. Simulate Load Testing Scenarios</li> <li>4. Conduct Performance Testing</li> <li>5. Generate and Analyze Test Reports</li> </ol>	30

	<b>Total Hours</b> <b>245</b>
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# **Generic Units of Competencies**

<b>Unit Code and Title</b>	<b>GU-02-L2-V1: Carryout workplace interaction in English</b>
<b>Unit Descriptor</b>	This unit covers the knowledge, skills and attitudes (KSA) required in carryout workplace interaction in English.  It specifically includes interpreting workplace communication and etiquette, reading and understanding workplace documents, participating in workplace meetings and discussions and practicing professional ethics at workplace.
<b>Nominal Hours</b>	<b>15 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables
1. Interpret workplace communication and etiquette	1.1. Workplace code of conducts are interpreted as per organizational guidelines. 1.2. Appropriate lines of communication are maintained with supervisors and colleagues 1.3. Workplace interactions are conducted in a <b><u>courteous manner</u></b> to gather and convey information 1.4. Questions about routine <b><u>workplace procedures and matters</u></b> are asked and responded as required.
2. Read and understand workplace documents	2.1 Workplace documents are interpreted as per standard. 2.2 Assistance is taken to aid comprehension when required from peers/supervisors. 2.3 Visual information/symbols/signage's are understood and followed. 2.4 Specific and relevant information are accessed from <b><u>appropriate sources</u></b> 2.5 Appropriate medium is used to transfer information and ideas
3. Participate in workplace meetings and discussions	3.1 Team meetings are attended on time and followed meeting procedures and etiquette 3.2 Own opinions are expressed and listened to those of others without interruption 3.3 Inputs are provided consistent with the meeting purpose and interpreted and implemented meeting outcomes
4. Practice professional ethics at workplace	4.1 Responsibilities as a team member are demonstrated and kept promises and commitments made to others 4.2 Tsks are performed in accordance with workplace procedures 4.3 Confidentially is respected and maintained 4.4 Situations and actions considered inappropriate or which present a conflict of interest are avoided.
<b>Range of Variables</b>	

<b>Variables</b>	<b>Range</b> (may include but not limited to):
1. Courteous manner	1.1 Effective questioning 1.2 Active listening 1.3 Speaking skills
2. Workplace procedures and matters	2.1 Notes 2.2 Agenda 2.3 Simple reports such as progress and incident reports 2.4 Job sheets 2.5 Operational manuals 2.6 Brochures and promotional materials 2.7 Visual and graphic materials 2.8 Standards 2.9 OSH information 2.10 Signs
3. Appropriate sources	3.1 HR department 3.2 Managers 3.3 Supervisors
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Followed workplace code of conducts is as per organizational guidelines 1.2 Interpreted workplace documents as per standard 1.3 Interpreted workplace instructions and symbols 1.4 Interpreted and implemented meeting outcomes
2. Underpinning knowledge	2.1 Workplace communication and etiquette 2.2 Workplace documents, signs and symbols 2.3 Meeting procedure and etiquette
3. Underpinning skills	3.1 Demonstrating performance of workplace communication and etiquette 3.2 Following workplace instructions and symbol 3.3 Following workplace code of conducts as per organizational guidelines 3.4 Interpreting workplace documents as per standard 3.5 Interpreting and implementing meeting outcomes
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Sincere and honest to duties 4.3 Promptness in carrying out activities 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect of peers and seniors in workplace 4.8 Communicate with peers and seniors in workplace

5. Resource implications	5.1 relevant tools, equipment, software and facilities needed to perform the activities 5.2 required learning materials
6. Methods of assessment	Competency should be assessed by: 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

<b>Unit Code and Title</b>	<b>GU-04-L1-V1: Work in a Team Environment</b>
<b>Unit Descriptor</b>	This unit covers the knowledge, skills and attitude required to carry out workplace interaction.  It specifically includes identifying team goals and processes, communicating and cooperating with team members, working as a team member, solving problems as a team member.
<b>Nominal Hours</b>	<b>20 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold underlined</u></b> terms are elaborated in the Range of Variables
1. Identify team goals and processes	1.1 Team goals and collaborative decision-making processes are identified. 1.2 Role and common goals of the team are defined from available <b><u>sources of information</u></b> . 1.3 Team structure, responsibilities and reporting relations are identified from team discussions and other external sources.
2. Communicate and cooperate with team members	2.1 Communication and negotiation skills are applied and maintained in all relevant situations. 2.2 Constructive contributions are made to <b><u>workplace discussions</u></b> on such issues as production, quality and safety. 2.3 Goals/ objectives and action plans undertaken in the workplace are communicated promptly. 2.4 Information regarding problems and issues are organized coherently to ensure clear and effective communication. 2.5 Dialogue is initiated with appropriate personnel. 2.6 Communication problems and issues are raised 2.7 Barriers to communication are identified and resolved
3. Work as a team member	3.1 Effective forms of communication are used to interact with <b><u>team members</u></b> in discussing team activities and objectives. 3.2 Mutual respect, empathy and active collaboration are demonstrated 3.3 Communication channels are followed as per <b><u>workplace context</u></b> .
4. Solve problems as a team member	4.1 Current and potential problems faced by team are identified. 4.2 Problems are investigated and analyzed. 4.3 Potential solutions of problem are identified.

	4.4 Recommendations about possible solutions are developed, documented, ranked and presented to team members for decision.
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range</b> (may include but not limited to):
1. Sources of information	1.1 Organizational structures 1.2 Operations manuals 1.3 Job description 1.4 Standard operating procedures
2. Workplace discussions	2.1 Coordination meetings 2.2 Toolbox discussion 2.3 Peer-to-peer discussion
3. Team members	3.1 Coach/members 3.2 Supervisor/manager 3.3 Peers/colleagues 3.4 Other members/employee representative of the organization
4. Workplace context	4.1 National laws and statutes 4.2 Standard operating procedures 4.3 Workplace rules and regulations
<b>Evidence Guide</b>	
The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspects of competency	1.1 Demonstrated knowledge in working in a team environment. 1.2 Satisfied the requirements mentioned in the performance criteria and range of variables.
2. Underpinning knowledge	2.1 Sources of information define 2.2 Team structure, role, and responsibility. 2.3 Individual member's roles and responsibilities. 2.4 Effective verbal communication methods 2.5 Communication flow and reporting structures. 2.6 Interpersonal communication skills. 2.7 Organization requirements for written and electronic communication methods 2.8 Communication problems and issues 2.9 Barriers in communication 2.10 Team planning. 2.10 Team meeting procedures. 2.11 Workplace etiquette 2.12 Industry maintenance, service and helpdesk practices, processes and procedures 2.13 Industry standard diagnostic tools

	2.14 Malfunctions and resolutions
2 Underpinning skills	4.1 Organizing sources of information 4.2 Identifying the role and responsibility of the team. 4.3 Identifying roles and responsibilities of individual members. 4.4 Identifying effective verbal communication methods 4.5 Identifying communication flow and reporting structure. 4.6 Identifying interpersonal communication skills 4.7 Complying with organization requirements for the use of written and electronic communication methods 4.8 Negotiation and communication skills 4.9 Participating in team discussion. 4.10 Working as a team member. 4.11 Participating in a variety of workplace discussions 4.12 Effective clarifying and probing skills 4.13 Identifying issues 4.14 Identifying current industry standard diagnostic tools 4.15 Describing common malfunctions and resolutions. 4.16 Determining the root cause of a routine malfunction
3 Underpinning attitude	5.1 Commitment to occupational health and safety 5.2 Promptness in carrying out activities 5.3 Sincere and honest to duties 5.4 Environmental concerns 5.5 Eagerness to learn 5.6 Tidiness and timeliness 5.7 Respect for rights of peers and seniors in workplace 5.8 Communication with peers and seniors in workplace
4 Resource implications	The following resources must be provided: 6.1 Work place Procedure 6.2 Materials relevant to the proposed activity 6.3 Relevant specifications or work instructions
5 Methods of assessment	Competency should be assessed by: 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning 6.4 Portfolio
6 Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment center 7.2 Assessment should be done by a NSDA certified/nominated assessor
<b>Accreditation Requirements</b>	

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

## **Sector Specific Units of Competencies**

<b>Unit Code and Title</b>	<b>SU-ICT-05-L3-V1: Use Internet and Access Resources</b>
<b>Unit Descriptor</b>	This unit covers the knowledge, skills, and attitudes required to use the internet and access resources. It specifically includes the task of preparing resources for sharing, accessing resources using the internet, and using and managing e-mail.
<b>Nominal Hours</b>	<b>30 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables
1. Prepare resources for sharing	1.1 <b><u>The document</u></b> is scanned with the required <b><u>file format</u></b> 1.2 The file is converted to required file format using <b><u>file conversion tools</u></b> 1.3 File <b><u>compression tools</u></b> are used for compression and extraction. 1.4 Multiple PDF documents are joined (if required)
2. Access Resources using the Internet	2.1. The internet <b><u>browser</u></b> is selected and installed. 2.2. <b><u>Browser setting</u></b> is carried out for smooth operation. 2.3. Resources are accessed using <b><u>Search engines.</u></b> 2.4. Resources are preserved in local storage.
3. Use e-mail	3.1 E-mail account is created with a selected <b><u>e-mail service provider.</u></b> 3.2 <b><u>E-mail operations</u></b> are performed as required 3.3 E-mail messages are printed.
<b>Range of Variables</b>	
Variable	Range (may include but not limited to):
1. Document	1.1 Single Page document 1.2 Multiple-page document 1.3 Picture 1.4 Signature
2. File format	2.1. .jpeg 2.2. .png 2.3. .pdf
3. File conversion tools	3.1 Offline Tools (Default application) 3.1.1. .doc/ .docx to .pdf, 3.1.2. .xls/ .xlsx to .pdf, 3.1.3. .ppt/ .pptx to .pdf, 3.1.4. .jpg to .pdf  3.2 Offline Tools (PDF to Others) 3.2.1. PDF converter 3.2.2. PDF Editor 3.2.3. Foxit PDF Editor

	<p>3.2.4. Adobe PDF Editor</p> <p>3.3 Online Tools</p> <p>3.3.1. <a href="http://www.ilovepdf.com">www.ilovepdf.com</a></p> <p>3.3.2. <a href="http://www.pdf2go.com">www.pdf2go.com</a></p> <p>3.3.3. <a href="https://pdf2doc.com/">https://pdf2doc.com/</a></p>
4. Compression tools	<p>4.1. WinZip</p> <p>4.2. WinRAR</p> <p>4.3. 7zip</p>
5. Browsers	<p>5.1. Microsoft Edge</p> <p>5.2. Google Chrome</p> <p>5.3. Mozilla Firefox</p> <p>5.4. Opera</p> <p>5.5. Safari</p> <p>5.6. Duronto browser</p>
6. Browser setting	<p>6.1 Bookmark</p> <p>6.2 Privacy and security</p> <p>6.3 Language</p> <p>6.4 Download</p> <p>6.5 Cookies</p> <p>6.6 History</p>
7. Search engines	<p>7.1 google</p> <p>7.2 Yahoo</p> <p>7.3 Ask</p> <p>7.4 MSN</p> <p>7.5 Bing</p> <p>7.6 Pipilika</p> <p>7.7 Duckduckgo</p> <p>7.8 AltaVista</p>
8. E-mail Service Provider	<p>8.1. Free mail services</p> <p>8.1.1. Gmail</p> <p>8.1.2. Yahoo</p>
9. Email Operations	<p>9.1. Compose</p> <p>9.2. Send</p> <p>9.2.1. Attachment</p> <p>9.2.2. Single Recipient</p> <p>9.2.3. Multiple Recipient</p> <p>9.2.4. CC</p> <p>9.2.5. BCC</p> <p>9.3. Receive</p> <p>9.4. Reply</p> <p>9.5. Forward</p> <p>9.6. Delete</p>

**Evidence Guide**

The evidence must be authentic, valid, sufficient, reliable, consistent, and recent and meet all requirements of the current version of the Unit of Competency.

1. Critical Aspects of Competency	<p>The assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Prepared resources for sharing:</li> <li>1.2 Scanning, converting, compressing, and merging files</li> <li>1.3 Accessed resources using the Internet:</li> <li>1.4 Installing and configuring browsers, using search engines, and managing downloads.</li> <li>1.5 Used and operated e-mail:</li> <li>1.6 Creating accounts, composing, sending, receiving, replying, forwarding, and printing emails.</li> </ul>
2.Underpinning knowledge	<ul style="list-style-type: none"> <li>2.1 Understanding the Internet and the World Wide Web (WWW).</li> <li>2.2 Familiarity with URLs, web browsers, and websites.</li> <li>2.3 Web Browsers like Chrome, Firefox, Edge, etc.</li> <li>2.4 Websites</li> <li>2.5 URLs</li> <li>2.6 Search Engines like Google, Bing, DuckDuckGo, etc.</li> <li>2.7 Effective search strategies for locating resources online</li> <li>2.8 Awareness of copyright and fair use policies.</li> <li>2.9 Bookmarks, privacy, cookies, and history cleaning.</li> <li>2.10 History of the cleaning process.</li> <li>2.11 Platforms for connecting with others and sharing information</li> <li>2.12 The importance of equal access to technology and the Internet</li> <li>2.13 Use of file conversion tools (offline and online) for various formats: DOC, PDF, JPG, XLS, etc.</li> <li>2.14 Use of file Compressing and extracting tools like WinRAR, 7zip, or WinZip.</li> <li>2.15 Managing different document types: single-page, multi-page, images, and signatures.</li> <li>2.16 Creating accounts on platforms like Gmail or Yahoo.</li> <li>2.17 Performing email operations (sending with CC/BCC, attaching files, replying, forwarding).</li> <li>2.18 Understanding online responsibilities, including privacy, respectful communication, and data security.</li> </ul>
3.Underpinning skills	<ul style="list-style-type: none"> <li>3.1 Accessing and sharing resources from the Internet.</li> <li>3.2 Downloading/uploading files, documents, and videos from/to websites.</li> <li>3.3 Managing email operations with attachments, recipients, and printing</li> <li>3.4 Performing responsibly and ethically online.</li> <li>3.5 Respecting copyright laws and promoting safe Internet use.</li> </ul>
4.Required attitudes	<ul style="list-style-type: none"> <li>4.1 Commitment to occupational safety and health.</li> <li>4.2 Promptness in carrying out activities.</li> <li>4.3 Sincere and honest to duties.</li> <li>4.4 Eagerness for understanding processes related to document</li> </ul>

	<p>preparation and email management.</p> <p>4.5 Environmental Concerns.</p> <p>4.6 Respect for the rights of peers, subordinates, and seniors at the workplace.</p> <p>4.7 Ensuring the confidentiality and reliability</p> <p>4.8 Communicates clearly and effectively with peers, subordinates, and supervisors in the workplace.</p> <p>4.9 Acknowledging the importance of equal access to technology.</p> <p>4.10 Maintains a clean and orderly workstation.</p> <p>4.11 Ensures timeliness and tidiness in daily tasks.</p>
<p>5.Resource implications</p>	<p>The following resources must be provided:</p> <p>5.1 Workplace (actual or simulated).</p> <p>5.2 Projector or interactive whiteboard for demonstrations.</p> <p>5.3 Desktop or laptop computers with sufficient specifications to run Pre-installed software.</p> <p>5.4 Printer (laser or inkjet) with various printing capabilities (single/both sides, odd/even pages).</p> <p>5.5 USB pen drives, portable hard drives, and optical disks for file transfer practice.</p> <p>5.6 Internet access for cloud-based applications like Google Docs and updates for installed software.</p> <p>5.7 Adjustable chairs and desks for ergonomic typing practice.</p> <p>5.8 Training manuals, Handouts, or guides detailing software use, customization, animations, and file management.</p> <p>5.9 Examples/Pre-designed presentation templates for different purposes (business, educational, portfolios</p> <p>5.10 Operating Systems: Windows, macOS, or Linux pre-installed on training computers.</p> <p>5.11 Web Browsers: Google Chrome, Mozilla Firefox, Microsoft Edge, Opera, Safari</p> <p>5.12 File Conversion Tools: Offline Tools: Microsoft Office Suite (Word, Excel, and PowerPoint with PDF export options). Adobe Acrobat or Foxit PDF Editor for PDF editing and conversion. Online Tools: Websites like ilovepdf.com, pdf2go.com, and pdf2doc.com.</p> <p>5.13 Compression Tools: WinRAR, 7zip, and WinZip.</p> <p>5.14 Free email service providers (e.g., Gmail, Yahoo) for hands-on training in email operations.</p> <p>5.15 Search engines for practice: Google, Bing, DuckDuckGo, etc.</p> <p>5.16 Training manuals covering the curriculum on email operations, file management, and internet usage.</p>

	<p>5.17 Short, practical video tutorials on tasks like scanning documents, compressing files, and creating emails.</p> <p>5.18 Single-page and multi-page documents in various file formats (e.g., .docx, .pdf, .jpg).</p> <p>5.19 Signature and image files for editing and merging exercises.</p>
6.Methods of assessment	<p>Methods of assessment may include but are not limited to:</p> <p>6.1 Written test;</p> <p>6.2 Demonstration;</p> <p>6.3 Oral questioning;</p>
7.Context of assessment	<p>7.1 Competency assessment must be done in NSDA accredited center.</p> <p>7.2 Assessment should be done by NSDA-certified/ nominated assessor</p>
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by the National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

<b>Unit Code and Title</b>	<b>SU-ICT-06-L3-V1: Comply to Ethical Standards in IT Workplace</b>
<b>Nominal Hours</b>	<b>15 Hours</b>
<b>Unit Descriptor</b>	<p>This unit covers the skills, knowledge and attitude required in comply to ethical standards in IT workplace.</p> <p>It includes upholding the requirements of clients, delivering quality products and services, maintaining professionalism at workplace and workplace code of conduct.</p>
<b>Elements of Competency</b>	<p><b>Performance Criteria</b>  <b><u>Bold and Underlined</u></b> terms are elaborated in the Range of Variables.</p>
1. Uphold the requirements of clients	<p>1.1 Clients' requirements are identified.</p> <p>1.2 Confidentiality of information is maintained in accordance with workplace policies/organizational policies/national legislation.</p> <p>1.3 Potential conflicts of interest are identified and involved parties of potential conflicts are notified.</p> <p>1.4 Proprietary rights of client/customer is asserted.</p>
2. Deliver quality products and services	<p>2.1 Products and services are provided according to the clients' requirements.</p> <p>2.2 Work is completed as per standards.</p> <p>2.3 Quality processes are implemented when developing products services.</p>
3. Maintain professionalism at workplace	<p>3.1 Work processes are delivered as per standards.</p> <p>3.2 Skills, knowledge and qualifications are presented in a professional manner.</p> <p>3.3 Services and products developed by self and others are delivered as per workplace standard.</p> <p>3.4 Unbiased and objective information are provided to clients.</p> <p>3.5 Realistic estimates for time, cost and delivery of outputs are presented during negotiation.</p>
4. Maintain workplace code of conduct	<p>4.1 Workplace code of conduct are interpreted</p> <p>4.2 Workplace code of conduct is followed.</p>
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range</b> (may include but not limited to):
<b>Evidence Guide</b>	
The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	

1 Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ol style="list-style-type: none"> <li>1.1 Asserted proprietary rights of client/customer.</li> <li>1.2 Completed work to industry and international standards.</li> <li>1.3 Implemented quality processes when developing</li> <li>1.4 Delivered services and products developed by self and others.</li> <li>1.5 Provided unbiased and objective information to clients.</li> <li>1.6 Followed workplace code of conduct.</li> </ol>
2 Underpinning knowledge	<ol style="list-style-type: none"> <li>2.1 Corporate code of confidentiality of information</li> <li>2.2 Organizational policies, national legislation and workplace policies in relation to IT sector</li> <li>2.3 Law and regulations pertaining to proprietary rights</li> <li>2.4 Quality processes for products and services</li> <li>2.5 Procedure of provided to client information</li> <li>2.6 Method of estimating for time, cost and delivery products and services</li> <li>2.7 Workplace code of conduct in IT sector</li> </ol>
3 Underpinning skills	<ol style="list-style-type: none"> <li>3.1 Upholding confidentiality of information in accordance with organizational policies, national legislation and workplace policies</li> <li>3.2 Asserting proprietary rights of client/customer</li> <li>3.3 Completing work in accordance with industry and international standards</li> <li>3.4 Implementing quality processes when developing products and services</li> <li>3.5 Delivering correctly services and products developed by self and others</li> <li>3.6 Providing unbiased and objective information are to clients.</li> <li>3.7 Presenting realistic estimates for time, cost and delivery of outputs during negotiation</li> <li>3.8 Following workplace code of conduct</li> </ol>
4 Underpinning attitudes	<ol style="list-style-type: none"> <li>4.1 Commitment to occupational health and safety</li> <li>4.2 Environmental concerns</li> <li>4.3 Eagerness to learn</li> <li>4.4 Tidiness and timeliness</li> <li>4.5 Respect for rights of peers and seniors in workplace</li> </ol>
5 Resource implications	<ol style="list-style-type: none"> <li>5.1 Relevant tools, Equipment, software and facilities needed to perform the activities.</li> <li>5.2 Required learning materials.</li> </ol>

6. Methods of assessment	Competency should be assessed by: 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

<b>Unit Title</b>	<b>SU-ICT-12-L3-V1: Manage Online Marketplace for Freelancing</b>
<b>Unit Descriptor</b>	This unit covers the knowledge, skills and attitudes required to manage freelancing activities effectively in an online marketplace. It includes creating and optimizing accounts, building a brand, acquiring projects, managing multiple clients, and maintaining professional relationships for sustainable growth.
<b>Nominal Hours</b>	<b>15 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables)
1. Establish Presence on Online Marketplaces	<p>1.1 Appropriate <b><u>freelancing platforms</u></b> are researched and selected based on skills and target clients.</p> <p>1.2 Profiles are created and optimized to reflect expertise and attract clients.</p> <p>1.3 <b><u>Payment methods</u></b> are set up to ensure secure and timely transactions.</p> <p>1.4 Marketplace rules, guidelines, and policies are familiarized.</p>
2. Create a Professional Profile	<p>2.1 Key <b><u>skills and expertise</u></b> are defined and showcased in the profile.</p> <p>2.2 Professional and engaging profile description is written.</p> <p>2.3 Keywords in profile and gig descriptions are used to rank higher in search result</p> <p>2.4 Portfolio of past work and certifications is added to enhance credibility.</p>
3. Identify and Bid on Projects	<p>3.1 Suitable projects aligned with personal skills and expertise are identified.</p> <p>3.2 Compelling and customized proposals are written for potential clients.</p> <p>3.3 Competitive pricing and timelines are set while bidding on projects.</p> <p>3.4 Terms, timelines, and deliverables are negotiated with clients</p> <p>3.5 Organized records of ongoing projects, deadlines, and payments are maintained.</p>
4. Deliver Quality Work	<p>4.1 Project requirements are interpreted and deliverables with the client are agreed.</p> <p>4.2 Appropriate <b><u>tools and techniques</u></b> are used to complete the work efficiently.</p> <p>4.3 Quality of deliverables are ensured to meet client expectations.</p> <p>4.4 Work is submitted within the agreed timeline and necessary revisions are provided.</p>

5. Maintain Client Relationships	<p>5.1 Communication with clients using <b>communication tools</b> is maintained regularly to update progress and address concerns.</p> <p>5.2 Feedback on delivered work is sought, and improvements are made based on suggestions.</p> <p>5.3 Long-term relationships are built by providing consistent quality and reliability.</p> <p>5.4 Repeat business and referrals are encouraged by maintaining professionalism.</p>
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range</b> (may include but not limited to):
1. Freelancing platforms	<p>1.1 Upwork</p> <p>1.2 Fiverr</p> <p>1.3 Freelancer</p> <p>1.4 Total</p> <p>1.5 Guru</p> <p>1.6 People Per Hour</p> <p>1.7 99designs, etc.</p>
2. Payment methods	<p>2.1 Payoneer</p> <p>2.2 PayPal,</p> <p>2.3 bank transfers,</p> <p>2.4 marketplace wallets.</p>
3. Skills and expertise	<p>3.1 Writing,</p> <p>3.2 graphic design,</p> <p>3.3 web development,</p> <p>3.4 digital marketing,</p> <p>3.5 virtual assistance</p>
4. Tools and Techniques	<p>4.1 Project management tools (e.g., Trello, Asana),</p> <p>4.2 design software (e.g., Photoshop), etc.</p>
5. Communication Tools	<p>5.1 Marketplace messaging systems,</p> <p>5.2 email,</p> <p>5.3 video conferencing platforms</p>
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspects of competency	<p>Assessment required evidences that the candidate:</p> <p>1.1 identified safety and health issues for IT workplace</p> <p>1.2 identified safety signs and symbols</p> <p>1.3 established safe and hygiene work environment</p> <p>1.4 identified hazards and risks and followed safe workplace operating procedure</p> <p>1.5 identified and reported emergency situations</p> <p>1.6 taken preventive and correctives measures for maintaining safe conditions in the workplace</p> <p>1.7 prevented from social media and internet addiction.</p>

<p>2. Underpinning knowledge</p>	<p>2.1 Importance of maintaining OSH in IT workplace.  2.2 Personal protective equipment requirements for IT related jobs.  2.3 Type of IT workplace and Safe and hygiene work environment.  2.4 Safety and Health issues for IT workplace:  2.4.1 ergonomics impairment  2.4.2 eye Stress / Eyesight impairment.  2.4.3 hearing outage  2.4.4 pain in the limb  2.4.5 hypertension / blood pressure  2.4.6 obesity  2.4.7 carpal tunnel syndrome  2.4.8 thrombosis  2.4.9 repetitive strain injury  2.4.10 radiation  2.4.11 internet addiction.  2.5 Health and hygiene precaution requirement in IT workplace.  2.6 OSH policies and procedures for IT workplace.  2.7 Types of incidents and risk in IT workplace.  2.8 Emergency situations and Workplace emergency procedures.  2.9 Safety sign and tags.  2.10 Types of hazards.  2.11 Reporting and recording procedure.  2.12 Internet and social media addiction and its impact in health and safety.</p>
<p>3. Underpinning skills</p>	<p>3.1 Identifying safety and health issues in IT workplace.  3.2 Applying personal health and safety practices for IT workplace.  3.3 Identifying and reporting hazards and risks.  3.4 Following and responding in emergency response procedures.  3.5 Maintaining and improving health and safety in the IT workplace.  3.6 Preventing from Social media and internet addition.</p>
<p>4. Required attitudes</p>	<p>4.1 Commitment to occupational health and safety in workplace and personal life.  4.2 Promptness in carrying out activities.  4.3 Maintaining cleanliness and safe work environment.  4.4 Sincere and honest to duties.  4.5 Eagerness to learn.  4.6 Tidiness and timeliness.  4.7 Environmental concerns in workplace.  4.8 Respect for rights of peers and seniors at workplace.  4.9 Communication with peers and seniors at workplace.  4.10 Following IT ethics and preventing from internet and social media addition.</p>
<p>5. Resource implication</p>	<p>The following resources must be provided:  5.1 workplace (actual or simulated)  5.2 equipment and outfits appropriate in applying safety measures  5.3 tools, materials and documentation required  5.4 relevant specifications or work instructions.</p>

6. Methods of assessment	<p>Methods of assessment may include but not limited to:</p> <p>6.1 written test</p> <p>6.2 demonstration</p> <p>6.3 oral questioning</p> <p>6.4 portfolio.</p>
7. Context of assessment	<p>7.1 Competency assessment must be done in NSDA accredited center.</p> <p>7.2 Assessment should be done by NSDA certified/ nominated assessor</p>
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

## Occupation Specific Units of Competencies

<b>Unit Code and Title</b>	<b>OU-ICT-SQA-01-L3-V1: Interpret Software Quality Assurance (SQA)</b>
<b>Unit Descriptor</b>	This unit covers the skills, knowledge and attitude required to Interpret Software Quality Assurance (SQA). It specifically includes explaining SQA fundamental & quality assurance (QA) process, describing roles and responsibilities in software quality assurance engineer, identifying software development lifecycle and integration with QA process, and categorizing software, testing types, principles & best practices.
<b>Nominal Hours</b>	<b>20 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables
1. Explain SQA fundamental & Quality Assurance (QA) Process	1.1 <b><u>SQA principles</u></b> are explained in accordance with ISTQB standards and practices. 1.2 <b><u>QA processes</u></b> are identified and described as per ISTQB guidelines. 1.3 <b><u>Documentation</u></b> for SQA activities are prepared. 1.4 Software <b><u>testing level &amp; types</u></b> and methodologies are recognized following best practices. 1.5 <b><u>Types of major defects</u></b> are identified and explain using <b><u>standard tools</u></b> . 1.6 <b><u>Defect severity</u></b> and <b><u>priority classification</u></b> are described.
2. Describe roles and responsibilities in Software Quality Assurance Engineer	2.1 <b><u>Roles and responsibilities in SQA engineer</u></b> are identified as per organizational needs. 2.2 Communication channels within the SQA team are described. 2.3 Collaboration between development, QA, and DevOps teams is described.
3. Identify SDLC and STLC	3.1 <b><u>Software development lifecycle stages</u></b> are identified. 3.2 Software development lifecycle and QA processes are described. 3.3 <b><u>Software testing lifecycle stages</u></b> are identified. 3.4 <b><u>Continuous improvement practices</u></b> are identified.
4. Categorize Software, Testing types, Principles & Best Practices	4.1 <b><u>Software types</u></b> are identified based on <b><u>functional and non-functional attributes</u></b> . 4.2 <b><u>Various testing types</u></b> are identified in relation to the software development process. 4.3 <b><u>Testing tools</u></b> are identified.
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range</b> (may include but not limited to):
1. SQA Principles	1.1 Testing shows the presence of defects, not their absence

	<ul style="list-style-type: none"> <li>1.2 Exhaustive testing is impossible</li> <li>1.3 Early testing saves time and money</li> <li>1.4 Defects cluster together</li> <li>1.5 Beware of the pesticide paradox</li> <li>1.6 Testing is context-dependent</li> <li>1.7 Absence-of-errors is a fallacy</li> </ul>
2. QA processes	<ul style="list-style-type: none"> <li>2.1 Test Planning</li> <li>2.2 Monitoring and Control</li> <li>2.3 Test Analysis</li> <li>2.4 Test Design</li> <li>2.5 Test Implementation</li> <li>2.6 Test Execution</li> <li>2.7 Test Completion</li> </ul>
3. Documentation	<ul style="list-style-type: none"> <li>3.1 Testing/task checklist</li> <li>3.2 Test plans</li> <li>3.3 Test cases</li> <li>3.4 Test scripts</li> <li>3.5 Defects logs</li> <li>3.6 Test Strategy</li> <li>3.7 Test summary reports</li> <li>3.8 Risk based test strategies</li> <li>3.9 Requirement traceability matrices (RTM)</li> </ul>
4. Testing level & types	<ul style="list-style-type: none"> <li>4.1 Unit testing</li> <li>4.2 Integration testing</li> <li>4.3 System testing</li> <li>4.4 Acceptance testing</li> <li>4.5 Performance testing</li> <li>4.6 Smoke testing</li> <li>4.7 Regression and Retesting</li> <li>4.8 Risk based testing</li> <li>4.9 Maintenance testing</li> </ul>
5. Types of major defects	<ul style="list-style-type: none"> <li>5.1. Functional defects</li> <li>5.2. Performance defects</li> <li>5.3. Security defects</li> <li>5.4. Usability defects</li> <li>5.5. Compatibility defects</li> <li>5.6. Data defects</li> <li>5.7. UI/UX defects</li> <li>5.8. Logical defects</li> <li>5.9. Configuration defects</li> <li>5.10. Accessibility defects</li> </ul>
6. Standard tools	<ul style="list-style-type: none"> <li>6.1 Bug tracking systems</li> <li>6.2 Version control systems</li> </ul>

	<ul style="list-style-type: none"> <li>6.3 QA project management software</li> <li>6.4 Defect triage process</li> <li>6.5 Image/videos capturing tools</li> <li>6.6 Test data management tools</li> <li>6.7 Load and Performance testing tools</li> <li>6.8 API testing tools</li> <li>6.9 Automation testing tools</li> <li>6.10 Security testing tools</li> </ul>
<p>7. Roles and responsibilities in SQA engineer</p>	<ul style="list-style-type: none"> <li>7.1 Role <ul style="list-style-type: none"> <li>7.1.1 SQA manager</li> <li>7.1.2 SQA analyst</li> <li>7.1.3 Test designer</li> <li>7.1.4 Automation engineer</li> <li>7.1.5 SQA System administrator</li> <li>7.1.6 Tester</li> </ul> </li> <li>7.2 Responsibilities <ul style="list-style-type: none"> <li>7.2.1 Test plan development</li> <li>7.2.2 Test case design</li> <li>7.2.3 Test implementation</li> <li>7.2.4 Test execution</li> <li>7.2.5 Defect reporting</li> <li>7.2.6 Quality metrics analysis</li> <li>7.2.7 Process improvement</li> <li>7.2.8 Compliance assurance</li> <li>7.2.9 Performance testing and analysis</li> <li>7.2.10 Security testing and ethical hacking responsibility</li> <li>7.2.11 Summary and details reporting</li> </ul> </li> </ul>
<p>8. Software development lifecycle stages</p>	<ul style="list-style-type: none"> <li>8.1. Requirement analysis</li> <li>8.2. Planning</li> <li>8.3. Design</li> <li>8.4. Development</li> <li>8.5. Testing</li> <li>8.6. Deployment</li> <li>8.7. Maintenance</li> </ul>
<p>9. Software testing lifecycle stages</p>	<ul style="list-style-type: none"> <li>9.1. Requirement analysis</li> <li>9.2. Test planning</li> <li>9.3. Test analysis and design</li> <li>9.4. Environment setup</li> <li>9.5. Test execution</li> <li>9.6. Test closer</li> </ul>

<p>10. Continuous improvement practices</p>	<p>10.1. Regular feedback loops  10.2. Root cause analysis  10.3. Process optimization  10.4. Automated testing and continuous integration  10.5. Performance metrics  10.6. Incremental changes  10.7. Test process audits  10.8. Shift-right testing (production monitoring and feedback loops)</p>
<p>11. Software types</p>	<p>11.1. System software  11.2. Application software  11.3. Development software  11.4. Utility software  11.5. Embedded software  11.6. Database software  11.7. Web software  11.8. Cloud-native applications  11.9. Microservices-based applications</p>
<p>12. Functional and non-functional attributes</p>	<p>12.1. <b>Functional attributes</b>  12.1.1. User authentication  12.1.2. Data processing  12.1.3. Reporting  12.1.4. Search functionality  12.1.5. API Interactions  12.1.6. Business Logic validation  12.2. <b>Non-functional attributes</b>  12.2.1. Performance  12.2.2. Scalability  12.2.3. Reliability  12.2.4. Usability  12.2.5. Security  12.2.6. Maintainability  12.2.7. Compatibility  12.2.8. Accessibility compliance (WCAG, ADA, Section 508)</p>
<p>13. Various testing types</p>	<p>13.1. Unit testing  13.2. Integration testing  13.3. System testing  13.4. Acceptance testing  13.5. Regression testing  13.6. Re-testing  13.7. Performance testing  13.8. Security testing</p>

	13.9. Usability testing 13.10. Compatibility testing 13.11. API testing
14. Testing tools	14.1. Selenium 14.2. Playwright 14.3. JUnit 14.4. testNG 14.5. Appium 14.6. Postman 14.7. JIRA 14.8. loadRunner 14.9. Apache JMeter 14.10. SoapUI 14.11. Cypress 14.12. Katalon Studio 14.13. SonarQube (Code Quality & Security Analysis)
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: <ol style="list-style-type: none"> <li>1.1 explained SQA fundamental &amp; quality assurance (QA) process</li> <li>1.2 described roles and responsibilities in software quality assurance engineer</li> <li>1.3 identified software development lifecycle and integration with QA process</li> <li>1.4 categorized software, testing types, principles &amp; best practices</li> </ol>
2. Underpinning knowledge	<ol style="list-style-type: none"> <li>2.1 SQA principles</li> <li>2.2 Industry standards and practices</li> <li>2.3 Organizational guidelines</li> <li>2.4 Testing techniques and methodologies</li> <li>2.5 Types of defects</li> <li>2.6 Standard tools and procedures</li> <li>2.7 Roles and responsibilities in SQA engineer</li> <li>2.8 Software development lifecycle stages</li> <li>2.9 Software development lifecycle and QA processes</li> <li>2.10 Continuous improvement practices</li> <li>2.11 Functional and non-functional attributes</li> <li>2.12 Various testing types</li> <li>2.13 Testing tools</li> <li>2.14 Industry standards and practices</li> </ol>

	<ul style="list-style-type: none"> <li>2.1.1 ISO 9000</li> <li>2.1.2 CMMI</li> <li>2.1.3 IEEE standards</li> <li>2.1.4 ISTQB Testing Standards</li> <li>2.1.5 ISO/IEC 25010 (Software Quality Model)</li> <li>2.1.6 Agile Testing Manifesto</li> </ul>
3. Underpinning skills	<ul style="list-style-type: none"> <li>3.1 Explaining SQA principles</li> <li>3.2 Identifying QA processes</li> <li>3.3 Recognizing testing techniques and methodologies</li> <li>3.4 Identifying types of defects</li> <li>3.5 Using standard tool and procedures</li> <li>3.6 Identifying roles and responsibilities in SQA engineer`</li> <li>3.7 Identifying software lifecycle stages</li> <li>3.8 Identifying continuous improvement practices</li> <li>3.9 Identifying software types</li> <li>3.10 Identifying testing tools</li> </ul>
4. Required attitude	<ul style="list-style-type: none"> <li>4.1 Commitment to occupational health and safety</li> <li>4.2 Sincere and honest to duties</li> <li>4.3 Promptness in carrying out activities</li> <li>4.4 Eagerness to learn</li> <li>4.5 Tidiness and timeliness</li> <li>4.6 Respect of peers and seniors in workplace</li> <li>4.7 Communicate with peers and seniors in workplace</li> </ul>
5. Resource implications	<ul style="list-style-type: none"> <li>5.1 Workplace (simulated or actual)</li> <li>5.2 Learning materials</li> <li>5.3 Organizational guidelines</li> <li>5.4 Different types of software</li> <li>5.5 Testing tools</li> </ul>
6. Methods of assessment	<p>Competency should be assessed by:</p> <ul style="list-style-type: none"> <li>6.1 Written test</li> <li>6.2 Demonstration</li> <li>6.3 Oral Questioning</li> <li>6.4 Portfolio</li> </ul>
7. Context of assessment	<ul style="list-style-type: none"> <li>7.1 Competency assessment must be done in NSDA accredited assessment centre</li> <li>7.2 Assessment should be done by a NSDA certified/nominated assessor</li> </ul>
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit</p>	

towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

<b>Unit Code and Title</b>	<b>OU-ICT-SQA-02-L3-V1: Perform Manual Testing</b>
<b>Unit Descriptor</b>	<p>This unit covers the skills, knowledge and attitude required to perform manual testing.</p> <p>It specifically includes analyzing software requirements, developing test strategy and plan, designing test scenarios and cases, test cases and identifying defects/bugs, documenting and reporting testing results and conducting UAT and completing testing activities.</p>
<b>Nominal Hours</b>	<b>80 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables
1. Analyze Software Requirements	<p>1.1 <b><u>Software requirements</u></b> are identified to alignment with project objectives.</p> <p>1.2 <b><u>Inconsistencies</u></b> requirements are identified for resolution.</p> <p>1.3 <b><u>Functional and non-functional requirements</u></b> are identified based on software specifications.</p> <p>1.4 <b><u>Stakeholder</u></b> inputs are analyzed to validate and clarify software requirements.</p> <p>1.5 <b><u>Requirement changes</u></b> are analyzed to assess their impact on existing features &amp; functionalities and testing activities.</p>
2. Develop Test Strategy and Plan	<p>2.1 <b><u>Test objectives and scope</u></b> are identified clearly based on software requirements and project goals.</p> <p>2.2 <b><u>Test types and techniques</u></b> are selected appropriately to meet the testing requirements.</p> <p>2.3 Test schedules and resource allocations are planned in alignment with project timelines and constraints.</p> <p>2.4 Test environment setup requirements are identified and documented according to technical specifications.</p> <p>2.5 Risk factors affecting testing activities are assessed and mitigated to ensure smooth execution.</p>
3. Design Test Scenarios and Cases	<p>3.1 <b><u>Test scenarios</u></b> are identified.</p> <p>3.2 <b><u>Positive and negative test cases</u></b> are designed to validate different system behaviors.</p> <p>3.3 Boundary conditions and edge cases are considered and incorporated in test case design.</p> <p>3.4 Test cases are reviewed and validated to ensure alignment with project requirements.</p>
4. Perform Test execution and Identify Defects/Bugs	<p>4.1 Test environment is set up and configured according to the test plan.</p>

	<p>4.2 Test cases are developed systematically to ensure comprehensive validation of software functions.</p> <p>4.3 Test cases are executed systematically and accurately according to documented steps.</p> <p>4.4 Actual results are compared against expected results, and deviations are accurately identified as defects/bugs.</p> <p>4.5 <b><u>Defects and bugs</u></b> are identified based on deviations from expected outcomes.</p> <p>4.6 Defect severity and priority levels are determined according to organizational standards.</p> <p>4.7 Bug life cycle is recognized and tracked as per software testing.</p> <p>4.8 Test execution status is updated regularly and accurately</p>
5. Document and Report Testing Results	<p>5.1 <b><u>Testing results</u></b> are documented accurately to capture test case outcomes and system behaviors.</p> <p>5.2 Test execution logs and supporting evidence are maintained for future reference and audits.</p> <p>5.3 <b><u>Testing reports</u></b> are prepared comprehensively to summarize key findings and testing coverage.</p>
6. Conduct UAT & Complete Testing Activities	<p>6.1 <b><u>User Acceptance Testing (UAT) requirements</u></b> are identified to validate system functionality.</p> <p>6.2 Test results and feedback from users are recorded for analysis and improvement.</p> <p>6.3 Issues are identified during UAT.</p> <p>6.4 Sign-off for UAT completion is obtained formally from relevant stakeholders.</p>
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range</b> (may include but not limited to):
1. Software requirements	<p>1.1 Functional requirements specifications</p> <p>1.2 Non-functional requirements specifications</p> <p>1.3 Acceptance criteria</p>
2. Inconsistencies	<p>2.1 Contradiction</p> <p>2.2 Missing details</p> <p>2.3 Unclear requirements</p>
3. Functional and non-functional requirements	<p>3.1 Core system functions</p> <p>3.2 User operations</p>
4. Stakeholder	<p>4.1 Business analysts</p> <p>4.2 Product owners</p> <p>4.3 Project managers</p>

5. Requirement changes	5.1 Scope adjustments 5.2 Version updates 5.3 Refinement requests
6. Test objectives and scope	6.1 Coverage goals 6.2 Functionality 6.3 System boundaries
7. Test types and techniques	7.1 Test types <ul style="list-style-type: none"> <li>• Functional testing</li> <li>• Non-functional testing</li> </ul> 7.2 Test techniques <ul style="list-style-type: none"> <li>• Black-box testing <ul style="list-style-type: none"> <li>• Boundary value analysis</li> <li>• Equivalence class partition</li> <li>• Decision table</li> <li>• State transition</li> <li>• Error guessing</li> <li>• Cause-effect mapping</li> </ul> </li> <li>• White box testing</li> <li>• Gray box testing</li> <li>• Experience based testing</li> <li>• Exploratory testing</li> </ul>
8. Test scenarios	8.1 User operations 8.2 System interactions 8.3 Integration flows
9. Positive and negative test cases	9.1 Positive test cases <ul style="list-style-type: none"> <li>• Expected user behaviors</li> <li>• System functions</li> </ul> 9.2 Negative test cases <ul style="list-style-type: none"> <li>• Invalid inputs</li> <li>• Error scenarios</li> <li>• Unexpected behaviors</li> </ul>
10. Defects and bugs	10.1 Functional errors 10.2 Performance issues 10.3 Security vulnerabilities
11. Testing results	11.1 Pass/fail status 11.2 Discrepancies 11.3 Observations
12. Testing reports	12.1 Summary reports 12.2 Details reports <ul style="list-style-type: none"> <li>• Defect matrices</li> <li>• Test execution reports</li> </ul>
13. User Acceptance Testing (UAT) requirements	13.1 User roles 13.2 Test environment

	13.3 Acceptance criteria
<b>Evidence Guide</b>	
The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ol style="list-style-type: none"> <li>1.1 analyzed software requirements</li> <li>1.2 developed test strategy and plan</li> <li>1.3 designed test scenarios and cases</li> <li>1.4 designed test cases and identified defects/bugs</li> <li>1.5 documented and reported testing results</li> <li>1.6 conducted UAT &amp; completed testing activities</li> </ol>
2. Underpinning knowledge	<ol style="list-style-type: none"> <li>2.1 Software requirements</li> <li>2.2 Inconsistencies requirements</li> <li>2.3 Functional and non-functional requirements</li> <li>2.4 Stakeholder inputs</li> <li>2.5 Requirements changes</li> <li>2.6 Test objectives and scope</li> <li>2.7 Test types and techniques</li> <li>2.8 Test schedules and resources</li> <li>2.9 Test scenarios</li> <li>2.10 Positive and negative test cases</li> <li>2.11 Defects and bugs</li> <li>2.12 Testing results</li> <li>2.13 Testing reports</li> <li>2.14 User acceptance testing (UAT) requirements</li> </ol>
3. Underpinning skills	<ol style="list-style-type: none"> <li>3.1 Analyzing software requirements</li> <li>3.2 Selecting test types and techniques</li> <li>3.3 Developing test strategy and plan</li> <li>3.4 Designing test scenarios and cases</li> <li>3.5 Designing test cases</li> <li>3.6 Identifying defects/bugs</li> <li>3.7 Documenting testing results</li> <li>3.8 Reporting testing results</li> <li>3.9 Conducting UAT</li> <li>3.10 Completing testing activities</li> </ol>
4. Required attitude	<ol style="list-style-type: none"> <li>4.1 Commitment to occupational health and safety</li> <li>4.2 Sincere and honest to duties</li> <li>4.3 Promptness in carrying out activities</li> <li>4.4 Eagerness to learn</li> <li>4.5 Tidiness and timeliness</li> <li>4.6 Respect of peers and seniors in workplace</li> <li>4.7 Communicate with peers and seniors in workplace</li> </ol>

5. Resource implications	5.1 Workplace (simulated or actual) 5.2 Learning materials 5.3 Software's 5.4 Testing reports
6. Methods of assessment	Competency should be assessed by: 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre. 7.2 Assessment should be done by a NSDA certified/nominated assessor.
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

<b>Unit Code and Title</b>	<b>OU-ICT-SQA-03-L3-V1: Perform Automation Testing</b>
<b>Unit Descriptor</b>	<p>This unit covers the skills, knowledge and attitude required to perform automation testing.</p> <p>It specifically includes identifying software programming syntax and languages, appropriate tools and frameworks for automation, implementing programming best practices like OOP, developing automation scripts and framework, integrating automation tool with CI/CD pipeline, generating automation test reports.</p>
<b>Nominal Hours</b>	<b>75 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables
1 Identify Software Programming Syntax and Languages	<p>1.1 Programming languages relevant to automation testing are identified.</p> <p>1.2 <b><u>Syntax and key constructs</u></b> of programming languages are analyzed.</p> <p>1.3 Common programming concepts and logic structures are applied.</p> <p>1.4 <b><u>Coding standards</u></b> and best practices are followed to ensure maintainability and readability of scripts.</p>
2 Apply tools and frameworks for Automation	<p>2.1 <b><u>Automation testing tools</u></b> and frameworks are identified.</p> <p>2.2 Tools and frameworks are selected based on compatibility with the application under test and the technology stack.</p> <p>2.3 The selected tools and frameworks are integrated into the test environment to ensure smooth testing execution.</p>
3 Implement Object-Oriented Programming (OOP)	<p>3.1 Java programming principles are applied.</p> <p>3.2 Code reusability is ensured by implementing modular components.</p> <p>3.3 Inheritance and polymorphism are leveraged to enhance code flexibility and reduce redundancy.</p> <p>3.4 Code readability and maintainability are prioritized.</p>
4 Develop Automation Scripts and Framework	<p>4.1 <b><u>Types of locators</u></b> are identified.</p> <p>4.2 <b><u>Test data</u></b> is structured and integrated into automation scripts.</p> <p>4.3 <b><u>Framework components</u></b> are designed and implemented to facilitate efficient script development.</p> <p>4.4 Automation scripts are developed using the selected programming language and framework.</p> <p>4.5 Automation scripts are optimized for performance and maintainability.</p>

5 Generate Automation Test Reports	5.1 Test execution results are captured and documented in automation test reports. 5.2 Automation test reports are formatted according to organizational standards. 5.3 <b><u>Logs and screenshots</u></b> are included in the reports to support test findings and provide evidence for further analysis. 5.4 Automation test reports are generated and shared with stakeholders.
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range</b> (may include but not limited to):
1 Syntax and key constructs	2.1 Variables 2.2 Loops 2.3 Conditions 2.4 Functions 2.5 Array/list
2 Coding standards	3.1 Indentation 3.2 Naming conventions 3.3 Commenting practices
3 Automation testing tools	3.1 Selenium 3.2 Junit/ TestNG 3.3 Git 3.4 Postman 3.5 Apache JMeter
4 Types of locators	4.1 Assertions 4.2 Code patterns 4.3 Page Object Model (POM) 4.4 Test annotations 4.5 Data-driven testing
5 Test data	5.1 Static 5.2 Dynamic
6 Framework components	6.1 Modular testing framework 6.2 Page Object Model (POM)
7 Logs and screenshots	7.1 Execution logs 7.2 Error logs 7.3 Screen captures of failures
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1 Critical aspects of competency	Assessment required evidence that the candidate: <ul style="list-style-type: none"> <li>1.1 identified software programming syntax and languages</li> <li>1.2 identified appropriate tools and frameworks for automation</li> </ul>

	<ul style="list-style-type: none"> <li>1.3 implemented programming best practices like OOP</li> <li>1.4 developed automation scripts and framework</li> <li>1.5 generated automation test reports</li> </ul>
2 Underpinning knowledge	<ul style="list-style-type: none"> <li>2.1 Programming languages</li> <li>2.2 Syntax and key constructs</li> <li>2.3 Coding standards</li> <li>2.4 Automation testing tools</li> <li>2.5 Object-oriented programming (OOP) principles</li> <li>2.6 Types of locators</li> <li>2.7 Test data</li> <li>2.8 Framework components</li> <li>2.9 Automation tools</li> <li>2.10 Test results</li> <li>2.11 Automation scripts</li> <li>2.12 Text execution results</li> <li>2.13 Logs and screenshots</li> </ul>
3 Underpinning skills	<ul style="list-style-type: none"> <li>3.1 Identifying software programming syntax and languages</li> <li>3.2 Identifying appropriate tools and frameworks for automation</li> <li>3.3 Implementing programming best practices like OOP</li> <li>3.4 Developing automation scripts and framework</li> <li>3.5 Generating automation test reports</li> </ul>
4 Required attitude	<ul style="list-style-type: none"> <li>4.1 Commitment to occupational health and safety</li> <li>4.2 Sincere and honest to duties</li> <li>4.3 Promptness in carrying out activities</li> <li>4.4 Eagerness to learn</li> <li>4.5 Tidiness and timeliness</li> <li>4.6 Respect of peers and seniors in workplace</li> <li>4.7 Communicate with peers and seniors in workplace</li> </ul>
5 Resource implications	<ul style="list-style-type: none"> <li>5.1 Workplace (simulated or actual)</li> <li>5.2 Learning materials</li> <li>5.3 Programming languages</li> <li>5.4 Coding standards</li> <li>5.5 Automation testing tools</li> </ul>
6 Methods of assessment	<p>Competency should be assessed by:</p> <ul style="list-style-type: none"> <li>6.1 Written test</li> <li>6.2 Demonstration</li> <li>6.3 Oral Questioning</li> <li>6.4 Portfolio</li> </ul>
7 Context of assessment	<ul style="list-style-type: none"> <li>7.1 Competency assessment must be done in NSDA accredited assessment centre</li> </ul>

	7.2 Assessment should be done by a NSDA certified/nominated assessor
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**Accreditation Requirements**

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

<b>Unit Code and Title</b>	<b>OU-ICT-SQA-05-L3-V1: Perform fundamental API Testing</b>
<b>Unit Descriptor</b>	This unit covers the skills, knowledge and attitude required to Perform API testing. It specifically includes analyzing API requirements, developing API test strategies, installing and configuring API testing tools, developing and implementing API test cases and executing tests and generating reports.
<b>Nominal Hours</b>	<b>30 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables
1. Analyze API Requirements	1.1 <b><u>API requirements</u></b> are thoroughly reviewed and analyzed. 1.2 <b><u>Types of API</u></b> is identified 1.3 <b><u>Test scenarios</u></b> are created based on the identified API requirements. 1.4 Dependencies and constraints related to the API are identified. 1.5 <b><u>Validation criteria</u></b> for API performance and response are defined.
2. Develop API Test Strategies	2.1 Test environments are selected. 2.2 <b><u>Test data</u></b> and scenarios are identified. 2.3 <b><u>Risk areas</u></b> related to the API are assessed and prioritized. 2.4 API test strategy is developed based on API requirements.
3. Install and Configure API Testing Tools	3.1 <b><u>API testing tools</u></b> are installed according to the system requirements. 3.2 Integration of API testing tools with the testing environment is performed. 3.3 <b><u>Authentication and authorization</u></b> settings are configured. 3.4 API test scripts are successfully uploaded to the testing tool. 3.5 Test data and <b><u>parameters</u></b> are configured within the testing tools to align with the API requirements and test scenarios.
4. Develop and Implement API Test Cases	4.1 Test data is created and selected appropriately. 4.2 <b><u>Test case template</u></b> are implemented with different HTTP methods and request types. 4.3 <b><u>Error handling</u></b> and validation scenarios are included. 4.4 API test cases are developed based on the API requirements. 4.5 Test cases are structured to ensure clarity and maintainability for future testing cycles and updates. 4.6 Test case execution is monitored and results are analyzed.

5. Execute Tests and Generate Reports	<p>5.1 <b>Test execution</b> is monitored for errors or system performance.</p> <p>5.2 <b>Test results</b> are recorded accurately to track the outcomes of each test case.</p> <p>5.3 API test results are analyzed and compared against expected outcomes.</p> <p>5.4 API tests are executed according to the defined test cases.</p> <p>5.5 Reports are generated detailing test execution, errors, and performance metrics.</p> <p>5.6 Issues are documented and communicated with development teams.</p>
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**Range of Variables**

<b>Variables</b>	<b>Range</b> (may include but not limited to):
1 API requirements	1.1 Functional specifications 1.2 Integration points 1.3 Security considerations
2 Types of API	2.1 Rest API 2.2 Soap API
3 Test scenarios	3.1 Input values 3.2 Expected outcomes 3.3 Error handling
4 Validation criteria	4.1 Response time 4.2 Data accuracy 4.3 Error codes 4.4 Status codes
5 Test data	5.1 Input values 5.2 Valid/invalid data 5.3 Boundary conditions 5.4 Large payloads
6 Risk areas	6.1 Authentication 6.2 Rate limiting 6.3 Data validation 6.4 Third-party integrations
7 API testing tools	7.1 Postman 7.2 Rest Assured 7.3 Apache JMeter
8 Authentication and authorization	8.1 API keys 8.2 OAuth 8.3 JWT tokens 8.4 Basic authentication
9 Parameters	9.1 JSON 9.2 XML

	<ul style="list-style-type: none"> <li>9.3 Query parameters</li> <li>9.4 Headers</li> <li>9.5 Body content</li> </ul>
10 Test case template	<ul style="list-style-type: none"> <li>10.1 Test ID</li> <li>10.2 Short summary</li> <li>10.3 Preconditions</li> <li>10.4 Test steps</li> <li>10.5 Test data</li> <li>10.6 Expected results</li> <li>10.7 Actual results</li> <li>10.8 Postconditions</li> <li>10.9 Status: Pass/fail</li> </ul>
11 Error handling	<ul style="list-style-type: none"> <li>11.1 4xx/5xx errors</li> <li>11.2 Incorrect endpoints</li> <li>11.3 Unauthorized access</li> </ul>
12 Test execution	<ul style="list-style-type: none"> <li>12.1 Manual execution</li> <li>12.2 Automated scripts</li> <li>12.3 Test management tools</li> </ul>
13 Test results	<ul style="list-style-type: none"> <li>13.1 Logs</li> <li>13.2 Screenshots/recording</li> <li>13.3 Error codes</li> <li>13.4 Success codes</li> <li>13.5 Execution time</li> </ul>
<p><b>Evidence Guide</b></p> <p>The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency</p>	
1 Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 analyzed API requirements</li> <li>1.2 developed API test strategies</li> <li>1.3 installed and configured API testing tools</li> <li>1.4 developed and implements API test cases</li> <li>1.5 executed tests and generated reports</li> </ul>
2 Underpinning knowledge	<ul style="list-style-type: none"> <li>2.1 API requirements</li> <li>2.2 Test scenarios</li> <li>2.3 Validation criteria</li> <li>2.4 Test environment and tools</li> <li>2.5 Test data and scenarios</li> <li>2.6 Risk areas</li> <li>2.7 API testing tools</li> <li>2.8 Authentication and authorization settings</li> <li>2.9 Test data and parameters</li> <li>2.10 Error handling</li> <li>2.11 Test execution</li> </ul>

3 Underpinning skills	3.1 Analyzing API requirements 3.2 Developing API test strategy 3.3 Installing API testing tools 3.4 Configuring API testing tools 3.5 Developing API test cases 3.6 Implementing API test cases 3.7 Executing tests reports 3.8 Generating tests reports
4 Required attitude	4.1 Commitment to occupational health and safety 4.2 Sincere and honest to duties 4.3 Promptness in carrying out activities 4.4 Eagerness to learn 4.5 Tidiness and timeliness 4.6 Respect of peers and seniors in workplace 4.7 Communicate with peers and seniors in workplace
5 Resource implications	5.1 Workplace (simulated or actual) 5.2 Learning materials
6 Methods of assessment	Competency should be assessed by: 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning 6.4 Portfolio
7 Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

<b>Unit Code and Title</b>	<b>OU-ICT-SQA-06-L3-V1: Perform Fundamental Load and Performance Testing</b>
<b>Unit Descriptor</b>	This unit covers the skills, knowledge and attitude required to perform load and performance testing. It specifically includes setting up testing environment, define testing criteria & establish baseline, simulating load testing scenarios, conducting performance testing, and generating and analyzing test reports.
<b>Nominal Hours</b>	<b>25 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables
1 Set Up Testing Environment	<p>1.1 Testing environment is set up as per project requirements.</p> <p>1.2 Environment setup is verified for compatibility with load and performance <b><u>testing tools</u></b>.</p> <p>1.3 Required <b><u>software dependencies</u></b> and configurations are installed and configured.</p> <p>1.4 <b><u>Test data</u></b> is created to simulate production-like conditions for accurate load and performance testing.</p> <p>1.5 Testing environment is validated for network, server, and system performance.</p> <p>1.6 Environment setup is documented and shared with the testing team.</p>
2 Define Testing Criteria & Establish baseline	<p>2.1 <b><u>Testing criteria</u></b> are defined based on project requirements and objectives.</p> <p>2.2 Performance benchmarks are established using baseline data.</p> <p>2.3 <b><u>Key performance indicators (KPIs)</u></b> are identified and documented.</p> <p>2.4 Test criteria are validated with stakeholders to ensure alignment.</p> <p>2.5 Baseline performance values are established.</p> <p>2.6 <b><u>Test scenarios</u></b> and thresholds are communicated.</p>
3 Simulate Load Testing Scenarios	<p>3.1 Load testing scenarios are created based on expected <b><u>user traffic</u></b> and system capacity.</p> <p>3.2 Test cases are developed to simulate concurrent users and varying traffic volumes.</p> <p>3.3 <b><u>Simulated load conditions</u></b> are implemented using load testing tools.</p> <p>3.4 Scenarios are executed across different environments.</p> <p>3.5 Test results are recorded and analyzed.</p> <p>3.6 Load testing scenarios are adjusted based on feedback and observed results.</p>

4 Conduct Performance Testing	<p>4.1 Performance testing criteria are defined based on system requirements and user expectations.</p> <p>4.2 <b><u>Test scenarios</u></b> are designed to evaluate system performance under different loads.</p> <p>4.3 Performance tests are executed under controlled conditions.</p> <p>4.4 <b><u>Performance testing tools</u></b> are used to automate test execution and data collection.</p> <p>4.5 Test results are analyzed.</p> <p>4.6 <b><u>Recommendations</u></b> for performance improvements are provided based on testing outcomes.</p>
5 Generate and Analyze Test Reports	<p>5.1 Test results are analyzed for performance trends.</p> <p>5.2 Comparative analysis is performed against predefined performance benchmarks.</p> <p>5.3 <b><u>Performance metrics</u></b> are visualized in clear and understandable formats.</p> <p>5.4 <b><u>Test reports</u></b> are generated based on the performance testing data collected.</p> <p>5.5 Test reports are validated for accuracy and completeness.</p>
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range</b> (may include but not limited to):
1 Testing tools	<p>1.1 Apache JMeter</p> <p>1.2 Apache Bench</p>
2 Software dependencies	<p>2.1 Databases</p> <p>2.2 Third-party APIs</p>
3 Test data	<p>3.1 User simulations</p> <p>3.2 Transaction volumes</p> <p>3.3 Data types</p>
4 Testing criteria	<p>4.1 Response times</p> <p>4.2 Transaction throughput</p> <p>4.3 Server load</p>
5 Key performance indicators (KPIs)	<p>5.1 Page load time</p> <p>5.2 Request per second</p> <p>5.3 Error rates</p>
6 Test scenarios	<p>6.1 Simulated user load</p> <p>6.2 Stress conditions</p> <p>6.3 System crash tests</p> <p>6.4 Volume testing</p>
7 User traffic	<p>7.1 Expected number of users</p> <p>7.2 User concurrency</p>
8 Simulated load conditions	<p>8.1 Different types of user activity</p> <p>8.2 Reading data/writing data</p> <p>8.3 Browsing</p>

9 Performance testing tools	9.1 Apache JMeter 9.2 Apache Benchmark
10 Recommendations	10.1 Code optimization 10.2 Databased indexing
11 Performance metrics	11.1 Response time 11.2 Throughput 11.3 Latency 11.4 System resource usage
12 Test reports	12.1 Details 12.2 Summaries 12.3 Graphs 12.4 Tables 12.5 Charts 12.6 Comparison to benchmarks
<b>Evidence Guide</b>	
The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1 Critical aspects of competency	Assessment required evidence that the candidate: 1.1 setup testing environment 1.2 defined testing criteria 1.3 established baseline 1.4 simulated load testing scenarios 1.5 conducted performance testing 1.6 generated and analyzed test reports
2 Underpinning knowledge	2.1 Testing environment 2.2 Performance testing tools 2.3 Software dependencies 2.4 Test data 2.5 Testing criteria 2.6 Key performance indicators (KPIs) 2.7 Baseline performance 2.8 Test scenarios 2.9 User traffic 2.10 Simulated load conditions 2.11 Performance testing criteria 2.12 Test scenarios 2.13 Performance metrics 2.14 Test reports 2.15 Submitting forms
3 Underpinning skills	3.1 Setting up testing environment 3.2 Installing and configuring software dependencies 3.3 Creating test data 3.4 Validating testing environment

	<ul style="list-style-type: none"> <li>3.5 Defining testing criteria</li> <li>3.6 Establishing performance benchmarks</li> <li>3.7 Establishing baseline performance values</li> <li>3.8 Creating load testing scenarios</li> <li>3.9 Conducting performance testing</li> </ul>
4 Required attitude	<ul style="list-style-type: none"> <li>4.1 Commitment to occupational health and safety</li> <li>4.2 Sincere and honest to duties</li> <li>4.3 Promptness in carrying out activities</li> <li>4.4 Eagerness to learn</li> <li>4.5 Tidiness and timeliness</li> <li>4.6 Respect of peers and seniors in workplace</li> <li>4.7 Communicate with peers and seniors in workplace</li> </ul>
5 Resource implications	<ul style="list-style-type: none"> <li>5.1 Workplace (simulated or actual)</li> <li>5.2 Testing tools</li> <li>5.3 Software's</li> <li>5.4 Learning materials</li> </ul>
6 Methods of assessment	<p>Competency should be assessed by:</p> <ul style="list-style-type: none"> <li>6.1 Written test</li> <li>6.2 Demonstration</li> <li>6.3 Oral Questioning</li> <li>6.4 Portfolio</li> </ul>
7 Context of assessment	<ul style="list-style-type: none"> <li>7.1 Competency assessment must be done in NSDA accredited assessment centre</li> <li>7.2 Assessment should be done by a NSDA certified/nominated assessor</li> </ul>

### **Accreditation Requirements**

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

## Reference:

1. [www.onlc.com](http://www.onlc.com)
2. [www.courseoutline.auckland.ac.nz](http://www.courseoutline.auckland.ac.nz)
3. [www.cdpi.uiu.ac.bd](http://www.cdpi.uiu.ac.bd)
4. <https://qaharbor.com/>
5. <https://glomacs.com/training-course/quality-assurance-control>
6. <https://oxford-management.com/course/quality-assurance-control>

## Task Analysis Workshop

The Competency Standards for National Skills Certificate in Software Quality Assurance Occupation, Level- 4 is developed by NSDA on 25<sup>th</sup> January 2025.

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## Development of Competency Standard

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## Validation of Competency Standard

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