Maldives National Skills Development Authority
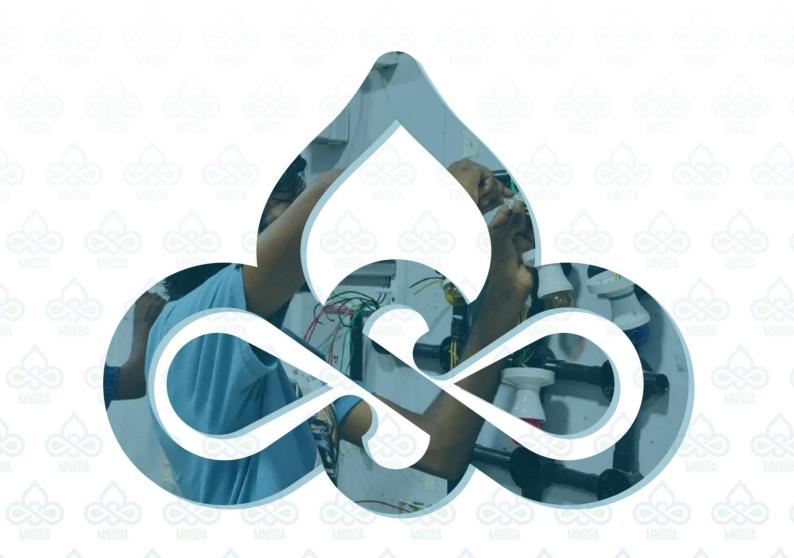

National Competency Standard for Programming

Standard Code: ICT-01L5-V1-24

Qualification Name: National Diploma in Programming

FOREWORD

The pivotal role of the Maldives National Skills Development Authority (MNSDA) in meticulously implementing and expanding Technical and Vocational Education & Training (TVET) exemplifies the steadfast commitment of the Maldives to build a skilled and resilient workforce. This commitment is evident from the strategic formulation of National Standards and the establishment of a comprehensive framework for training and certification.

Under the Higher Education and Training Act 7/2021, the MNSDA assumes an instrumental role, reflecting the government's unwavering dedication to streamlining TVET policies and procedures. This includes the establishment of a robust system for accrediting and registering both Institution Based Training (IBT) and Employer Based Training (EBT) providers. The MNSDA's active involvement in conducting the National Apprenticeship Program (NAP), National Trade Testing and Certification (NTTC), and the issuance of National Certificates reflects a comprehensive approach to ensure elevated quality standards and competency within the workforce.

The National Competency Standards (NCS) revised through the Maldives Enhancing Employability and Resilience of Youth (MEERY) project accentuates the commitment to updating and sustaining contemporary skill sets aligned precisely with industry demands. Deliberate efforts to revise existing NCS, coupled with the development of curriculum, teaching materials, resource books, and logbooks, attest to our dedication to ensuring the ongoing relevance and currency of the TVET system in the Maldives.

The active engagement of Technical Panels and Employment Sector Councils in the NCS development and approval process, coupled with alignment to the Maldives National Qualification Framework (MNQF) and accreditation by the Maldives Qualifications Authority (MQA), certifies that the TVET system not only remains highly responsive but also ensures the quality standards demanded by industries. This approach enables the system to effectively meet the diverse needs of industries and adapt to the evolving economic landscape.

The collaborative development of the National Diploma in Programming by the MNSDA, MEERY, and Villa College exemplifies the practical implementation of TVET initiatives. This training package represents a critical stride towards addressing the requisite skills while fostering opportunities to integrate sustainable economic development within the TVET framework.

Dr. Zahra Mohamed

Chief Executive Officer

Maldives National Skills Development Authority

EMPLOYMENT SECTOR COUNCILS

#	Name	Designation	Organization
01	Adam Iyaz	Director	Ministry of Homeland Security and Technology
02	Hussain Mohamed	IT Manager, IT Infrastructure	National Centre for Information Technology
03	Mariyam Asna Saeed	President	Women in Tech
04	Hassan Ali	Dep General Manager ICT	Maldives Water and Sewerage Company
05	Dr. Ali Fawaz Shareef	Deputy Vice Chancellor	Maldives National University
06	Naail Abdul Rahman	ICT Expert	-
07	Arushad Ahmed	ICT Expert	-
08	Dr. Ibrahim Shiyam	ICT Consultant	-
09	Shakeeba Ali	Director General	Maldives National Skills Development Authority

National Occupational Standard has been endorsed by:

Naail Abdul Rahman

Chairperson

ICT Sector Council

Maldives National Skills Development Authority

Umar Zahir Office Building, 5th Floor,

Orchid Ma higun, HulhuMale' , Republic of Maldives.

Date of Endorsement: 25/06/2024	Date of Revision: -

TECHNICAL SUPPORT

#	Name	Designation	Organization
01			
02			

#	Name	Designation	Organization
01	Abdulla Yameen	UIUX Software developer	Urbanco
02	Fahudh Adnan	Computer technician	Gan regional Hospital
03	Ameen Fahmy	Media Officer	People's Majilis
04	Ibrahim Waheed	Manager cum Lab Technician,	Faculty of Engineering and Technology, Villa college
05	Mohamed Ishan	Freelance lecturer	-

TECHNICAL PANEL MEMBERS

VERSION	DEVELOPER	DATE	STANDARD CODE
V1	Villa College	31/01/2024	ICT-01L5-V1-24

Standard Development Process

This standard is developed by adopting the content of Department of Education, Skills and Employment, Australia provided under a Creative Commons Attribution-No Derivative Works 3.0 Australia licence. In addition, changes were made to contextualise the content to the Maldivian environment and choose the units that are most appropriate for the Maldivian ICT industry.

Description of "Programming"

Computer programming is the process of writing code to facilitate specific actions in a computer, application or software program, and instructs them on how to perform. It involves writing a set of instructions in a programming language that a computer can understand and execute. Programming languages are used to communicate with computers and give them instructions. Examples of programming languages include Python, Java, C++, JavaScript, and many others. Each language has its own syntax and semantics, and programmers use these languages to create software applications, websites, games, and more.

Consulted experts on preparing the "National Diploma in Programming" standard

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Job opportunities upon completion of "National Diploma in Programming"

Upon successful completion of the National Diploma in Programming, students can work in the following jobs.
1. Software Developer/Engineer
2. Application Programmer
3. Software Engineer
4. Database Developer/Administrator
5. DevOps Engineer
6. UI/UX Developer

2. NATIONAL DIPLOMA IN PROGRAMMING

3. Qualification code: ICT-01L5-V1-24	**Total Number of Credits: 135**

4. Purpose of the qualification

This qualification provides the skills and knowledge for an individual to program in software development projects, as an independent ICT specialist or as part of a team This qualification prepares individuals to design and develop software for business organisations. Learners who complete the units of competencies will be able to work as software developers and programmers.

5. Regulations for the qualification	National Diploma in the occupation of Programming will be awarded to those who are competent in units 1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16+17+18+19+20+21+22+23+24+25

6. Schedule of Units

Unit No	Unit Title	Code
Common Competencies		
01	Originate and develop concepts	ICT-02-CM01-V1-24
02	Promote workplace cyber security awareness and best practices	ICT-02-CM02-V1-24
03	Lead and facilitate a team	ICT-02-CM03-V1-24
04	Match ICT needs with the strategic direction of the organisation	ICT-02-CM04-V1-24
05	Manage client problems	ICT-02-CM05-V1-24
Core Competencies		
06	Build advanced user interfaces	ICT-01-CC11-V1-24
07	Apply advanced programming skills	ICT-01-CC12-V1-24
08	Apply intermediate object-oriented language skills	ICT-01-CC13-V1-24
09	Manage data persistence using noSQL data stores	ICT-01-CC14-V1-24
10	Implement and use a web development frameworks	ICT-01-CC15-V1-24
11	Develop applications using agile methods	ICT-01-CC16-V1-24
12	Manage projects using software management tools	ICT-01-CC17-V1-24
13	Apply advanced object-oriented language skills	ICT-01-CC18-V1-24
14	Debug and monitor applications	ICT-01-CC19-V1-24
15	Deploy applications to production environments	ICT-01-CC20-V1-24
16	Design application architecture	ICT-01-CC21-V1-24
17	Implement security for applications	ICT-01-CC22-V1-24
18	Create mashups	ICT-01-CC23-V1-24
19	Maintain custom software	ICT-01-CC24-V1-24
20	Monitor and support data conversion to new ICT systems	ICT-01-CC25-V1-24

21	Install, test and evaluate pilot version of ICT systems	ICT-01-CC26-V1-24
22	Develop high-level object-oriented class specifications	ICT-01-CC27-V1-24
23	Perform ICT data conversions	ICT-01-CC28-V1-24
24	Implement Object Relational Mapping Framework for data persistence	ICT-01-CC29-V1-24
25	Develop advanced mobile multi-touch applications	ICT-01-CC30-V1-24
7.Accreditation requirements	The training provider should have a computer labs or similar training facility to provide the trainees the hands-on experience related to this qualification. Trainees must complete 100 hours of practicals.	
8. Recommended sequencing of units	As appearing under the section 06	

Unit Details

Unit No.	Unit Title	Code	Level	No. of credits	Credit Hours	Contact Hours
01	Originate and develop concepts	ICT-02-CM01-V1-24	V	03	30	10
02	Promote workplace cyber security awareness and best practices	ICT-02-CM02-V1-24	V	03	30	10
03	Lead and facilitate a team	ICT-02-CM03-V1-24	V	03	30	10
04	Match ICT needs with the strategic direction of the organisation	ICT-02-CM04-V1-24	V	03	30	10
05	Manage client problems	ICT-02-CM05-V1-24	V	03	30	10
06	Build advanced user interfaces	ICT-01-CC11-V1-24	V	06	60	20
07	Apply advanced programming skills	ICT-01-CC12-V1-24	V	06	60	20
08	Apply intermediate object-oriented language skills	ICT-01-CC13-V1-24	V	06	60	20
09	Manage data persistence using noSQL data stores	ICT-01-CC14-V1-24	V	06	60	20
10	Implement and use a web development frameworks	ICT-01-CC15-V1-24	V	06	60	20
11	Develop applications using agile methods	ICT-01-CC16-V1-24	V	06	60	20
12	Manage projects using software management tools	ICT-01-CC17-V1-24	V	06	60	20
13	Apply advanced object-oriented language skills	ICT-01-CC18-V1-24	V	06	60	20
14	Debug and monitor applications	ICT-01-CC19-V1-24	V	06	60	20
15	Deploy applications to production environments	ICT-01-CC20-V1-24	V	06	60	20
16	Design application architecture	ICT-01-CC21-V1-24	V	06	60	20
17	Implement security for applications	ICT-01-CC22-V1-24	V	06	60	20
18	Create mashups	ICT-01-CC23-V1-24	V	06	60	20
19	Maintain custom software	ICT-01-CC24-V1-24	V	06	60	20
20	Monitor and support data conversion to new ICT systems	ICT-01-CC25-V1-24	V	06	60	20
21	Install, test and evaluate pilot version of ICT systems	ICT-01-CC26-V1-24	V	06	60	20
22	Develop high-level object-oriented class specifications	ICT-01-CC27-V1-24	V	06	60	20
23	Perform ICT data conversions	ICT-01-CC28-V1-24	V	06	60	20
24	Implement Object Relational Mapping Framework for data persistence	ICT-01-CC29-V1-24	V	06	60	20
25	Develop advanced mobile multi-touch applications	ICT-01-CC30-V1-24	V	06	60	20
TOTAL				135	1350	450

Packaging of National Qualifications:

National Diploma in Web Development will be awarded to those who are competent in units 1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16+17+18+19+20+21+22+23+24+25

Qualification Code: ICT-01L5-V1-24

COMPETENCY BASED ASSESSMENT

The final assessment of the National Competency-Based Programmes conducted by the Maldives National Skills Development Authority (MNSDA) is a competency-based assessment.

The Competency-Based Assessment ensures that the students' performance meets the requirements specified in the National Competency Standards (NCS). This assessment approach is designed to verify that graduates are job-ready and meet established occupational competency requirements within their respective fields.

Eligibility for Final Assessment

To be eligible for the final Competency-Based Assessment, students must fulfil the following conditions:
- achieve a **minimum of 80%** attendance
- deemed competent in each of the units of the programme in the pre-assessment

Competency-Based Assessment Process

Upon submission of the Pre-assessment report by the training provider, MNSDA will check for all the necessary supporting documents and conduct Competency-Based Assessment through a National Assessor registered with MNSDA. It is important to note that any trainer involved in the training process is **not permitted** to conduct the assessment to maintain impartiality and integrity of the process.

The final Competency-Based Assessment conducted by MNSDA includes both:
- **Theory**: Evaluating students' knowledge and understanding of key theoretical aspects of the competency.
- **Practical:** Assessing hands-on skills and application of knowledge in real-world or simulated environments.

Once the assessment is completed, the National Assessor will send the Competency-Based Assessment Report to MNSDA.

Competency Status Requirement

For certification to be granted, the student must be officially declared **"Competent"** in each of the units of the programme by the National Assessor.

Conclusion

Competency-Based Assessment is a critical component in ensuring the quality and credibility of technical and vocational skills-based training. By adhering to the outlined procedure, MNSDA upholds the standards required to certify students who are fully prepared to meet industry demands.