



Maldives National Skills Development Authority



National Competency Standard for Artificial Intelligence and Data Science

Standard Code: ICT-03L5-V1-24

Qualification Name: National Diploma in Artificial Intelligence and Data Science

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 Artificial Intelligence and Data Science 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	Dr. Mohamed Kinaanath	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: 02/07/2024

TECHNICAL SUPPORT

#	Name	Designation	Organization
01			
02			

TECHNICAL PANEL MEMBERS			
#	Name	Designation	Organization
01	Mohamed Jailam	Managing Director	Javaabu PVT LTD
02	Hassaan Mohamed	Government Digital Service Specialist	National Center for Information Technology
03	Arushad Ahmed	Chied technology Officer	Javaabu PVT LTD

VERSION	DEVELOPER	DATE	STANDARD CODE
V1	Villa College	31/01/2024	ICT-03L5-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 “Artificial Intelligence and Data Science”

Artificial Intelligence (AI) refers to the development of computer systems that can perform tasks that typically require human intelligence. These tasks include learning, reasoning, problem-solving, understanding natural language, and perception. AI encompasses various subfields, such as machine learning, natural language processing, computer vision, robotics, and expert systems. Data Science involves the extraction of knowledge and insights from structured and unstructured data through a combination of statistics, domain knowledge, and programming skills. Data Science encompasses data cleaning, exploration, feature engineering, statistical analysis, and machine learning.

Consulted experts on preparing the “National Diploma in Artificial Intelligence and Data Science” standard

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.

Job opportunities upon completion of “National Diploma in Artificial Intelligence and Data Science”

Upon successful completion of the National Diploma in Artificial Intelligence and Data Science, students can work in the following jobs.

1. Data Entry Analyst
2. Data Technician.
3. Research Assistant (AI/ML)
4. Junior Data Analyst
5. AI Support Technician
6. Machine Learning Technician

1. Endorsement Application for Qualification 01

2. NATIONAL DIPLOMA IN ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

3. Qualification code: ICT-03L5-V1-24

Total Number of Credits: 135

4. Purpose of the qualification

This qualification provides the skills and knowledge for an individual to specialise themselves in machine learning, data analysis, statistics, programming, and the application of AI in various domains, as an independent ICT specialist or as part of a team. This qualification focuses on providing students with the knowledge and skills necessary for data design, data analytics and machine learning. Learners who complete the units of competencies will be able to work as data engineers, data analysts and data scientists.

5. Regulations for the qualification

National Diploma in the occupation of Artificial Intelligence and Data Science 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	Create a data warehouse	ICT-03-CC01-V1-24
07	Design databases	ICT-03-CC02-V1-24
08	Integrate databases with websites	ICT-03-CC03-V1-24
09	Manage data persistence using noSQL data stores	ICT-03-CC04-V1-24
10	Model data objects	ICT-03-CC05-V1-24
11	Monitor and improve knowledge management systems	ICT-03-CC06-V1-24
12	Manage ICT projects	ICT-03-CC07-V1-24
13	Model data processes	ICT-03-CC08-V1-24
14	Identify opportunities to apply artificial intelligence, machine learning and deep learning	ICT-03-CC09-V1-24
15	Automate work tasks using machine learning	ICT-03-CC10-V1-24
16	Train and evaluate machine learning models	ICT-03-CC11-V1-24
17	Data Science Foundations with Python, Data Visualization, Signal Processing, and Scheduling	ICT-03-CC12-V1-24
18	Build natural language processing models and pipelines	ICT-03-CC13-V1-24
19	Develop and maintain blockchain solutions	ICT-03-CC14-V1-24
20	Gather, analyse and verify data from different source inputs	ICT-03-CC15-V1-24
21	Monitor and support data conversion to new ICT systems	ICT-03-CC16-V1-24
22	Conduct significance tests	ICT-03-CC17-V1-24

23	Use unsupervised learning for clustering	ICT-03-CC18-V1-24
24	Perform ICT data conversions	ICT-03-CC19-V1-24
25	Program IoT devices	ICT-03-CC20-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	Create a data warehouse	ICT-03-CC01-V1-24	V	06	60	20
07	Design databases	ICT-03-CC02-V1-24	V	06	60	20
08	Integrate databases with websites	ICT-03-CC03-V1-24	V	06	60	20
09	Manage data persistence using noSQL data stores	ICT-03-CC04-V1-24	V	06	60	20
10	Model data objects	ICT-03-CC05-V1-24	V	06	60	20
11	Monitor and improve knowledge management systems	ICT-03-CC06-V1-24	V	06	60	20
12	Manage ICT projects	ICT-03-CC07-V1-24	V	06	60	20
13	Model data processes	ICT-03-CC08-V1-24	V	06	60	20
14	Identify opportunities to apply artificial intelligence, machine learning and deep learning	ICT-03-CC09-V1-24	V	06	60	20
15	Automate work tasks using machine learning	ICT-03-CC10-V1-24	V	06	60	20
16	Train and evaluate machine learning models	ICT-03-CC11-V1-24	V	06	60	20
17	Data Science Foundations with Python, Data Visualization, Signal Processing, and Scheduling	ICT-03-CC12-V1-24	V	06	60	20
18	Build natural language processing models and pipelines	ICT-03-CC13-V1-24	V	06	60	20
19	Develop and maintain blockchain solutions	ICT-03-CC14-V1-24	V	06	60	20
20	Gather, analyse and verify data from different source inputs	ICT-03-CC15-V1-24	V	06	60	20
21	Monitor and support data conversion to new ICT systems	ICT-03-CC16-V1-24	V	06	60	20
22	Conduct significance tests	ICT-03-CC17-V1-24	V	06	60	20
23	Use unsupervised learning for clustering	ICT-03-CC18-V1-24	V	06	60	20
24	Perform ICT data conversions	ICT-03-CC19-V1-24	V	06	60	20
25	Program IoT devices	ICT-03-CC20-V1-24	V	06	60	20
TOTAL				135	1350	450

Packaging of National Qualifications:

National Diploma in Artificial Intelligence and Data Science 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-03L5-V1-24

National Competency Standard for Artificial Intelligence and Data Science

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.