



Model Curriculum

SNOS - Foundation of Artificial Intelligence Technology

NOS Code: NIE/SSC/N1017

Version: 1.0

NSQF Level: 3.5

Training Parameters

Sector	IT-ITeS	
Sub-Sector	Artificial Intelligence	
Occupation	AI Development	
Country	India	
NSQF Level	3.5	
Aligned to NCO/ISCO/ISIC Code	NCO/2015 -2512.0204	
Minimum Educational Qualification and Experience	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)
	**Grade 10 pass and pursuing continuous schooling	No experience required
	**Grade 8 with 2 years of NTC in the field of IT Sector	No experience required
	**Grade 8th pass	3-year relevant experience in IT
	Previous NSQF Level 3 Required	1.5-year relevant experience in IT
	** Should have a basic understanding of coding.	
Pre-Requisite License or Training	NA	
Minimum Job Entry Age	16	
Last Reviewed On	18.02.2025	
Next Review Date	18.02.2028	
NSQC Approval Date	18.-02.2025	
QP Version	1.0	
Model Curriculum Creation Date	18.02.2025	
Model Curriculum Valid Up to Date	18.02.2028	
Model Curriculum Version	1.0	
Duration of the Course	90 Hours	

Program Overview

This section summarises the end objectives of the program along with its duration

Training Outcomes of the course:

i. Foundational Knowledge:

- **Understanding Artificial Intelligence Principles:** Participants will gain a comprehensive understanding of core AI concepts, including knowledge representation, reasoning, problem-solving, and intelligent agents.
- **Knowledge of AI Techniques:** Participants will become familiar with AI techniques such as machine learning algorithms, neural networks and predictive models.

ii. Technical Skills:

- **Natural Language Processing (NLP):** Participants will learn techniques for processing and understanding human language using AI models for tasks like sentiment analysis, text classification, and machine translation.
- **Computer Vision:** Participants will develop skills in AI-powered image and video analysis, including object detection, image recognition, and image segmentation.

iii. Tools and Technologies:

- **AI Development Tools:** Participants will gain hands-on experience with tools like TensorFlow, PyTorch, and Keras for building AI models.
- **AI Platforms:** Participants will utilize platforms like IBM Watson, Google AI, and Microsoft Azure AI for AI model deployment and experimentation.
- **Data Annotation and Preprocessing:** Participants will learn to preprocess and annotate data for AI training, including handling large datasets for image and text processing.

iv. Deployment and Integration:

- **AI Model Deployment:** Participants will understand how to deploy AI models in production environments, including integration with cloud platforms.
- **Real-time AI Systems:** Participants will learn how to implement real-time AI systems, using APIs and cloud services for tasks like real-time predictions and anomaly detection

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the Qualification file.

NOS/Module Name	NOS Details	Training Duration (Hours)		
		Th.	Pr.	Total
Foundation of Artificial Intelligence Technology NOS Code: NIE/SSC/N1017	The purpose of this qualification is to train the students in AI implementation using Python to upskill them and increase their employability in the field of IT/Computer Science. The purpose is to demystify AI and equip the future workforce with the confidence to learn and	35	55	90

NOS/Module Name	NOS Details	Training Duration (Hours)		
		Th.	Pr.	Total
	apply skills independently. The participants will get initial exposure for developing AI models.			
Total Duration		35	55	90

Module Details

Module (NOS): Foundation of Artificial Intelligence Technology

NOS Code: NIE/SSC/N1017

Terminal Outcomes:

- Able to apply python programming for developing ML models like regression and classification
- Students will learn the concept of Artificial Neural Networks and Deep Learning, their inter-connected structure of layers and the architecture.
- Students will learn how ANN can model complex function consisting of several processing elements that work on predefined activation functions.
- Students will learn the concept of Convolutional Neural Network, its architecture, concept of filters, pooling and activation functions.
- Students will learn and apply CNN model for image recognition tasks that involve the processing of pixel data.
- Students will use OpenCV for analyzing.
- Students will learn how to use object detection algorithms like Yolo etc.
- Students will learn the concept of Natural Language Processing and its various tools and libraries like NLTK.
- Students will learn Feature Engineering, Data Cleaning, Feature Extraction and Data Visualization for NLP.
- Deploying AI models over cloud platforms

Detailed Syllabus:

S. No	Elements	Contents	Duration	
			Theory	Practical
1	Introduction to AI Concepts	• Overview of Artificial Intelligence (AI) and its role in modern applications • Core concepts: intelligence, cognitive modelling • Understanding AI agents and environment interactions • AI issues, concerns and Ethical AI • Generative AI basics	5	2.5

2	Programming with Python for AI	• Importance of Python in AI • Python setup, installation, and Integrated Development Environment (IDE) • Basic Python programming: syntax, data types, control structures, function • Python libraries for ML: NumPy, Matplotlib, and Pandas.	5	10
3	Machine Learning Fundamentals	• Core machine learning principles: supervised vs. unsupervised learning • Foundational ML algorithms: linear regression, decision trees, clustering • Model evaluation techniques and accuracy metrics	6	9
4	Introduction to Deep Learning	• Introduction to Deep Learning: Artificial Neural Networks (ANN) and Convolutional Neural Networks (CNN) • Fundamentals of image classification using ANN • Building basic deep learning models with TensorFlow or PyTorch	5	10
5	Natural Language Processing (NLP) Fundamentals	• Introduction to Natural Language Processing (NLP): tokenization, stemming, lemmatization • Natural Language Understanding (NLU) concepts and applications • Using NLTK for basic NLP tasks	6	9
6	Computer Vision Basics	• Introduction to computer vision and its applications • Key image processing techniques: analysis, preprocessing, and edge detection • Simple object detection (e.g., face/eye detection)	5	10

7	AI Model Deployment	- Fundamentals of model deployment - Introduction to MLOps (Machine Learning Operations) - Basics of deploying AI models on cloud platforms (AWS, Google AI, Open source) - Introduction to Docker for containerization	3	4.5
Total Duration			35	55

Key Learning Outcomes:

Duration: 35 hours	Duration: 55 hours
Theory Key Learning Outcomes	Practical Key Learning Outcomes
Understanding AI and ML Concepts: Participants will comprehend key principles of Artificial Intelligence, Machine learning algorithms including supervised, unsupervised learning, and reinforcement learning approaches.	Implementation of AI Algorithms: Participants will apply algorithms such as Neural Networks, Decision Trees, and Support Vector Machines (SVM) using AI frameworks like TensorFlow and Keras.
Data Preprocessing Techniques: Participants will gain knowledge of data cleaning, normalization, feature scaling, and feature selection techniques to enhance AI model performance.	Hands-on Data Preprocessing: Participants will practice data preprocessing methods such as handling missing values, encoding categorical data, and applying standardization techniques using tools like Pandas and TensorFlow.
AI Model Evaluation and Validation: Participants will learn about evaluation metrics such as accuracy, precision, recall, F1-score, and the importance of model validation techniques.	Evaluation of AI Model Performance: Participants will use confusion matrices, cross-validation, and ROC curves to evaluate the effectiveness of AI models on real datasets.
Neural networks and AI applications: Understand deep learning concepts and their applications, Natural Language Processing (NLP) concepts and applications, Concepts of computer vision and its applications,	AI application development: Develop and implement simple neural networks for classification tasks, Perform foundational NLP tasks using Python and NLTK, Analyze and preprocess images for AI tasks, Implement simple object detection techniques
Classroom Aid	
The aids required to conduct sessions in the classroom are: 1. LCD Projector 2. Pin-up Board 3. White Board	

Tools, Equipment and Other Requirements

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	Classroom	1 (30 Sq.m)	30
2	Student Chair	30	30
3	Student Table	30	30
4	Desktop computer with accessories	• 12th Generation Intel® Core™ i5-12500T with Intel vPro® Enterprise • 8 GB DDR4-3200 MHz RAM (1 x 8 GB) • 512 GB PCIe® NVMe™ M.2 SSD • Intel® UHD Graphics 770 • Windows 11 Professional Installed with: Anaconda, Spyder, NumPy, Pandas, Matplotlib, Seaborn, Scikit-Learn, SciPy	30
5	Desk jet printer	1 Nos.	A4

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
A-Level/MCA/B. Tech	CS/IT/EC/EE / allied areas	-	-	1	CS/IT/EC/EE/ allied areas	-

Trainer Certification

Domain Certification	Platform Certification
Certified to TOT for the Standalone NOS “Foundation of Artificial Intelligence Technology” or equivalent as per NCrf. Minimum accepted score is 80%.	Recommended that the Trainer is certified for the Job Role: “Trainer (VET and skills)”, mapped to the Qualification Pack: “MEP/Q2601, v2.0” or equivalent as per NCrf. Minimum accepted score is 80%

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Year	Specialization	Year	Specialization	
A-Level/MCA/ B. Tech	CS/IT/EC/EE / allied areas	2	CS/IT/EC/EE/ allied areas	2	CS/IT/EC/EE/ allied areas	-

Assessor Certification	
Domain Certification	Platform Certification
Certified to TOT for the Standalone NOS “Foundation of Artificial Intelligence Technology” or equivalent as per NCeF.	Recommended that the assessor is certified for the Job Role: “Trainer (VET and skills)”, mapped to the Qualification Pack: “MEP/Q2701, v2.0” or equivalent as per NCeF.
Minimum accepted score is 80%	Minimum accepted score is 80%

Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required

competencies of the program.

Assessment of the qualification evaluates candidates to ascertain that they can integrate knowledge, skills and values for carrying out relevant tasks as

per the defined learning outcomes and assessment criteria.

The underlying principle of assessment is fairness and transparency. The evidence of the outcomes and assessment criteria. competence acquired by the candidate can be obtained by conducting Theory (Online) examination.

About Examination Pattern:

1. The question papers for the theory exams are set by the Examination wing (assessor) of NIELIT HQS.
2. The assessor assigns roll number.
3. The assessor carries out theory online assessments. Theory examination would be conducted online and the paper comprise of MCQ
4. Pass percentage would be 50% marks.
5. The examination will be conducted in English language only.

Quality assurance activities: A pool of questions is created by a subject matter expert and moderated by other SME. Test rules are set beforehand. Random set of questions which are according to syllabus appears which may differ from candidate to candidate. Confidentiality and impartiality are maintained during all the examination and evaluation processes.

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards