



## Model Curriculum

### Basics of Python Programming

**MCr Code: NloEaIT/MCr-0016**

**Version: 1.0**

**NSQF Level: 3**

### Training Parameters

Sector	IT-ITeS		
Sub-Sector	Artificial Intelligence		
Occupation	AI Development		
Country	India		
NSQF Level	3		
Aligned to NCO/ISCO/ISIC Code	NCO/2015-2512.0205		
Minimum Educational Qualification and Experience	<b>Sl. No</b>	<b>Academic/Skill Qualification (with Specialization - if applicable)</b>	<b>Required Experience (with Specialization - if applicable)</b>
	1	10th or equivalent	No Experience required
	2	**Grade 9th with pursuing continuous schooling in regular school	No Experience required
	3	**8th grade pass with 2 Year of NTC/NAC in relevant field of IT after 8th	No Experience required
** Should have a basic understanding of coding.			
Pre-Requisite License or Training	NA		
Minimum Job Entry Age	No Bar		
Last Reviewed On	<b>18-02-2025</b>		
Next Review Date	<b>18-02-2028</b>		
NSQC Approval Date	<b>18-02-2025</b>		
QP Version	1.0		
Model Curriculum Creation Date	<b>18-02-2025</b>		
Model Curriculum Valid Up to Date	<b>18-02-2028</b>		
Model Curriculum Version	1.0		
Duration of the Course	<b>30 hrs.</b>		

## Program Overview

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

### Training Outcomes of the course:

Upon completing the "Foundational in Python Programming" course, learners will gain practical skills in Python, including setting up the development environment, using basic programming constructs like variables, loops, and functions, and implementing libraries like NumPy and Pandas. They will also develop and execute a Python project, applying these concepts in real-world scenarios. This comprehensive training prepares learners for advanced Python studies or professional applications.

NOS/Module Name	Training Duration (Hours)		
	Theory	Practical	Total
<b>Basics of Python Programming</b> <b>MCr Code: NloEaIT/MCr-0016</b> <b>NSQF Level: 3</b>	<b>10</b>	<b>20</b>	<b>30</b>

## Module Details

**Module: Basics of Python Programming**  
**MCr Code: NloEaIT/MCr-0016**

### Terminal Outcome:

After completion of the module, the students shall be able to:

- Understand how to install Python, set up an integrated development environment (IDE), and execute basic Python programs.
- Demonstrate the use of variables, data types, conditional statements (if, else, elif), and loops (for, while) in writing simple Python programs.
- Create user-defined functions and apply them to organize and modularize code for reusability and clarity.
- Understand and manipulate Python lists and dictionaries, including operations like creation, indexing, slicing, and accessing elements.
- Perform basic file input and output operations in Python for reading from and writing to files.
- Apply basic functionalities of essential Python libraries such as NumPy (numerical operations), Matplotlib (data visualization), and Pandas (data handling).
- Integrate programming concepts in a practical mini-project that demonstrates problem-solving using Python.

### Syllabus:

- **Theory (10 Hours)**
  - Understanding how to set up the Python environment.
  - Learning about variables and different data types in Python.
  - Understanding conditional statements (if, else, elif) and learning about loops (for, while).

- Understanding the concepts of functions and learning to define and call functions.
- Understanding Python lists (creation, indexing, slicing, etc.) and dictionaries (creation, accessing, etc.), their properties, and uses.
- Understanding the basics of Python libraries - NumPy, Matplotlib, and Pandas.
- **Practical (20 Hours)**
  - Learning to install Python and an IDE.
  - Understanding how to write and execute simple Python scripts such as "Hello, World!"
  - Learning to perform basic operations with variables and data types.
  - Learning to write programs using conditional statements and loops.
  - Learning to create and use functions in Python programs.
  - Learning to read from and write to files using Python.
  - Learning to perform operations with lists and dictionaries in Python.
  - Learning to perform basic operations using various Python libraries.
  - Developing and implementing a project, integrating various concepts learned.

### Key Learning Outcomes:

<b>Duration: 10 hours</b>	<b>Duration: 20 hours</b>
<b>Theory</b>	<b>Practical</b>
Learners will understand setting up a Python environment, and grasp basic programming concepts and Python libraries.	Learners will effectively install Python, execute scripts, and develop applications using loops, functions, and file handling techniques.
<b>Classroom Aid</b>	
LCD Projector/Smart Board, Pin-up Board, White Board, Markers	
<b>Tools, Equipment and Other Requirements</b>	
<ul style="list-style-type: none"> <li>● Classroom, Students Chair, Students Table, Desktop computer with accessories</li> <li>● IDEs like PyCharm, Jupyter, AI libraries (TensorFlow, Scikit-learn)</li> </ul>	

### Annexure

#### Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
B. Tech in Computer Science/ IT/ Electronics and Communication / allied branches Or MCA Or BCA Or A- Level (IT)	Computer Science/ IT/ Electronics and Communication/ allied branches	-	-	1	-	-

Trainer Certification	
Domain Certification	Platform Certification
Certified to TOT for the Micro credential Code: <b>NloEaIT/MCr-0016 “Basics of Python Programming”</b> or equivalent as per NCrf.  Minimum accepted score is 80%	Recommended that the Trainer is certified for the Basics of Python Programming: “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
		Years	Specialization	Years	Specialization	
B. Tech in Computer Science/ IT/ Electronics and Communication / allied branches Or MCA Or BCA Or A- Level (IT)	Computer Science/ IT/ Electronics and Communication/ allied branches	-	-	2	-	-

Assessor Certification	
Domain Certification	Platform Certification
Certified to TOA for the Micro credential Code: <b>NloEaIT/MCr-0016 “Basics of Python Programming”</b> or equivalent as per NCrf.  Minimum accepted score is 80%	Recommended that the assessor is certified for the Basics of Python Programming: “Trainer (VET and skills)”, mapped to the Qualification Pack: “MEP/Q2701, v2.0” or equivalent as per NCrf.  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
<b>Declarative Knowledge</b>	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.
<b>Key Learning Outcome</b>	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).
<b>OJT (M)</b>	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
<b>OJT (R)</b>	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
<b>Procedural Knowledge</b>	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.
<b>Training Outcome</b>	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
<b>Terminal Outcome</b>	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
<b>QP</b>	Qualification Pack
<b>NSQF</b>	National Skills Qualification Framework
<b>NSQC</b>	National Skills Qualification Committee
<b>NOS</b>	National Occupational Standards