QUALIFICATION FILE – Micro Credentials

Basics of Python Programming

☐ Horizontal/Generic ☐ Vertical/Specialization

☐Upskilling ☐ Dual/Flexi Qualification ☐ For ToT ☐ For ToA

☐ General ☐ Multi-skill (MS) ☐ Cross Sectoral (CS) ☒Future Skills ☐ OEM

NCrF/NSQF Level: 3

Submitted By:
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Section 1: Basic Details

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<tr><td>1.</td><td>Micro Credential-Qualification Name</td><td colspan="2">Basics of Python Programming</td></tr>
<tr><td>2.</td><td>Sector/s</td><td colspan="2">IT-ITeS</td></tr>
<tr><td>3.</td><td>National Qualification Register (NQR) Code & Version (Will be issued after NSQC approval.)</td><td>NM-03-IT-03801-2025-V1-NIELIT</td><td>4. NCrF/NSQF Level: 3</td></tr>
<tr><td>5.</td><td>Brief Description of the Standalone NOS</td><td colspan="2">This course provides students with a comprehensive introduction to Python programming essentials. The theory component covers setting up the Python environment, understanding variables and data types, implementing conditional statements and loops, and mastering functions.</td></tr>
<tr><td>6.</td><td>Eligibility Criteria for Entry for a Student/Trainee/Learner/Employee</td><td colspan="2">Entry Qualification & Relevant Experience:
<table>
<tr><th>Sl. No</th><th>Academic/Skill Qualification (with Specialization - if applicable)</th><th>Required Experience (with Specialization - if applicable)</th></tr>
<tr><td>1</td><td>10th or equivalent</td><td>No Experience required</td></tr>
<tr><td>2</td><td>**Grade 9th pass with pursuing continuous schooling in regular school</td><td>No Experience required</td></tr>
<tr><td>3</td><td>**8th grade pass with 2 Year of NTC/NAC in relevant field of IT after 8th</td><td>No Experience required</td></tr>
</table>
** Should have a basic understanding of coding.</td></tr>
<tr><td>7.</td><td>Credits Assigned to this NOS-Qualification, Subject to Assessment
(as per National Credit Framework (NCrF))</td><td>1 Credits</td><td>9. Common Cost Norm Category (I/II/III) (wherever applicable): Category-II</td></tr>
<tr><td>9.</td><td>Any Licensing Requirements for Undertaking Training on This Qualification (wherever applicable)</td><td colspan="2">NA</td></tr>
<tr><td>10.</td><td>Expected Outcomes of the Micro Credential</td><td colspan="2">Terminal learning outcomes are:
• 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.</td></tr>
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<tr><td></td><td></td><td>

- 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.

</td></tr>
<tr><td>11.</td><td>Training Duration by Modes of Training Delivery (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)</td><td>☒Offline ☐Online ☐Blended
<table>
<tr><th>Training Delivery Modes</th><th>Theory (Hours)</th><th>Practical (Hours)</th><th>Total (Hours)</th></tr>
<tr><td>Classroom (Offline)</td><td>10</td><td>20</td><td>30</td></tr>
</table>
</td></tr>
<tr><td>12.</td><td>Assessment Criteria</td><td>
<table>
<tr><th>Theory (Marks)</th><th>Practical (Marks)</th><th>Project (Marks)</th><th>Viva (Marks)</th><th>Total (Marks)</th><th>Passing %age</th></tr>
<tr><td>25</td><td>25</td><td>00</td><td>00</td><td>50</td><td>50%</td></tr>
</table>
The centralized online assessment is conducted by the Examination Wing, NIELIT Headquarters.

*Assessment strategy shall be as per NIELIT Norms prevailing at times.
</td></tr>
<tr><td>13.</td><td>Is the Qualification Amenable to Persons with Disability</td><td>☒ Yes ☐ No
a. Locomotor Disability: Leprosy Cured Person, Dwarfism, Muscular Dystrophy and Acid Attack Victims
b. Visual Impairment: Low Vision</td></tr>
<tr><td>14.</td><td>How participation of women will be encouraged?</td><td>Participation by women can be ensured through Government Schemes. Occasionally, exclusive batches for women would be run for the proposed courses. Funding is available for women’s participation under other schemes launched by the Government from time to time.</td></tr>
<tr><td>15.</td><td>Other Indian languages in which the Qualification & Model Curriculum are being submitted</td><td>The Qualification File and Model Curriculum are available in both English and Hindi languages.</td></tr>
<tr><td>16.</td><td>Is similar NOS available on NQR-if yes, justification for this Qualification</td><td>☐ Yes ☒ No URLs of similar Qualifications:</td></tr>
</table>

17.	**Name and Contact Details Submitting / Awarding Body SPOC** *(In case of CS or MS, provide details of both Lead AB & Supporting ABs)*	**Name:** Dr. Vimala Mathew, Scientist E **Email:** vimala@nielit.gov.in **Contact No.:** 0495-228 7266 **Website:** https://nielit.gov.in	
18.	**Final Approval Date by NSQC: 18-02-2025**	**19. Validity Duration: 3 Years**	**20. Next Review Date: 18-02-2028**

Section 2: Training Related

1.	**Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	B. Tech in Computer Science/ IT/ Electronics and Communication/ allied branches Or MCA Or BCA Or A- Level (IT) with 1 year of Experience in training.
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	B. Tech in Computer Science/ IT/ Electronics and Communication/ allied branches Or MCA Or BCA Or A- Level (IT) with 2 year of Experience in training.
3.	**Tools and Equipment Required for the Training**	☒Yes ☐No (*If "Yes", details to be provided in Annexure-II)*

Section 3: Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	B. Tech in Computer Science/ IT/ Electronics and Communication/ allied branches Or MCA Or BCA Or A- Level (IT) with 2 year of Experience in training.
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines), (wherever applicable)*	The assessor carries out theory online assessments through the remote proctoring methodology. Theory examination would be conducted online and the paper comprise of MCQ. Conduct of assessment is through trained proctors. Once the test begins, remote proctors have full access to the candidate's video feeds and computer screens. Proctors authenticate the candidate based on registration details, pre-test image captured and I- card in possession of the candidate. Proctors can chat with candidates or give warnings to candidates. Proctors can also take screenshots, terminate a specific user's test session, or re-authenticate candidates based on video feeds.
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	External Examiners/ Observers (Subject matter experts) are deployed including NIELIT scientific officers who are subject experts for evaluation of Practical examination/ internal assessment / Project/ Presentation/ assignment and Major Project (if applicable). Qualification is generally B.Tech.

4.	**Assessment Mode** *(Specify the assessment mode)*	Online for Theory. Online/ Offline/ Blended for other assessment components depending on the region where the assessment is conducted
5.	**Tools and Equipment Required for Assessment**	☒ Same as for training ☒ Yes ☐ No (D*etails to be provided in Annexure-II)*

Section 4: Evidence of the Need for the Micro Credential

Provide Annexure/Supporting documents name.

1.	Government /Industry initiatives/ requirement (Yes/No): Yes
2.	Number of Industry validation provided: The Micro credentials are offered through IndiaAi Labs for Empowering the youth by imparting training in Emerging AI Technologies under India AI Future Skills pillar of IndiaAI Mission.
3.	Estimated number of people to be trained: 500

Section 5: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	**Annexure:** NCrF/NSQF level justification based on NCrF Level/NSQF descriptors *(Mandatory)*	Annexure I: Evidence of Level
2.	**Annexure:** Learning Outcomes and Assessment Criteria *(Mandatory)*	Annexure II: Assessment Criteria
3.	**Annexure:** Assessment Strategy *(Mandatory)*	Annexure III: Assessment Strategy
4.	**Annexure:** List of tools and equipment relevant for qualification *(Mandatory – Except in case of online course)*	Annexure IV: Tools & Equipment
5.	**Annexure:** Blended Learning *(Mandatory in case selected mode of delivery is "Blended Learning")*	Annexure V: Blended Learning
6.	**Annexure:** Acronym and Glossary *(Optional)*	Annexure VI: Acronym & Glossary

Annexure-I: Evidence of Level

NCrF/NSQF Level Descriptors	Key requirements of the job role/ outcome of the qualification	How the job role/ outcomes relate to the NCrF/NSQF level descriptor	NCrF/ NSQF Level
Professional Theoretical Knowledge/Process	● Students must demonstrate a thorough understanding of the foundational concepts of Python programming, including environment setup, data types, control structures (conditional statements and loops), functions, and file handling.	● The course provides students with a solid theoretical foundation in Python programming, covering essential concepts such as data types, control structures, functions, and file handling.	3
Professional and Technical Skills/ Expertise/ Professional Knowledge	● Students must demonstrate a strong command of Python programming, including the ability to set up the environment, utilize variables and data types, implement control structures (if, else, loops), and define functions.	● The course equips students with essential programming skills in Python, including the ability to set up the environment, utilize variables, implement control structures, and define functions.	3
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	● Students must demonstrate a strong understanding of Python programming fundamentals, including environment setup, data types, and control structures, and functions.	● Course equips students with essential programming skills, including Python environment setup, data types, control structures, and functions.	3
Broad Learning Outcomes/Core Skill	● Students must demonstrate a solid understanding of Python programming fundamentals, including environment setup, data types, control structures, functions, and file handling	● The course provides students with a comprehensive understanding of Python programming fundamentals, including environment setup, data types, control structures, and functions.	3
Responsibility	● Students must demonstrate a strong understanding of ethical considerations in data handling and annotation, including privacy concerns and responsible use of AI.	● The course emphasizes the importance of ethical considerations in data handling and annotation, preparing students to understand and adhere to ethical guidelines while managing sensitive information.	3

Annexure-II: Assessment Criteria

Detailed learning outcomes and assessment criteria for the qualification are as follows:

Assessment Criteria for Performance Criteria	Learning Outcome	Theory Marks	Practical Marks	Project Marks	Viva Marks
Set up the Python environment	● Ability to successfully install Python and an Integrated Development Environment (IDE) ● Execute a series of basic Python scripts that utilize variables, data types, conditional statements, and loops, with evaluations based on the correctness of the output and error-free execution.	25	25	00	00
Basic concepts of Artificial Intelligence, including machine learning, deep learning, computer vision, and natural language processing,	● Write a comprehensive essay that outlines the key concepts of artificial intelligence ● Deliver a presentation summarizing the basic concepts of AI and its components, using visual aids to illustrate examples of AI applications in various sectors, with peer feedback on clarity and depth of understanding.				
Supervised and unsupervised learning approaches and explain the importance of data annotation in machine learning	● Participate in a quiz or written test that assesses their ability to distinguish between supervised and unsupervised learning approaches, including definitions and key characteristics of each method. ● Complete a case study analysis where they identify a machine learning project that utilizes data annotation.				
		25	25	00	00
	Total Marks	50			

Annexure-III: 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.

Annexure-IV: Tools and Equipment (lab set-up)

List of Tools and Equipment

Batch Size: 30

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	Classroom	1 (30 Sq.m)	30
2	Student Chair	-	30
3	Student Table	-	30
4	Desktop computer with accessories	Installed with: o IDEs like PyCharm, Jupyter	30
5	LCD Projector	-	1
6	Deskjet printer	A4	1

Classroom Aids:

The aids required to conduct sessions in the classroom are:

1. LCD Projector/Smart Board
2. Pin-up Board
3. White Board, Markers, Chart paper and sketch pens

Annexure-V: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools: NA

Annexure-VI: Acronym & Glossary

Acronym

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
NCrF	National Credit Framework
NOS	National Occupational Standard(s)
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework

Glossary

Term	Description
National Occupational Standards (NOS)	NOS define the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do.
Qualification	A formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards
Qualification File	A Qualification File is a template designed to capture necessary information of a Qualification from the perspective of NSQF compliance. The Qualification File will be normally submitted by the awarding body for the qualification.
Sector	A grouping of professional activities on the basis of their main economic function, product, service or technology.