QUALIFICATION FILE-Standalone NOS

Foundation of Artificial Intelligence Technology

☐ 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: 3.5

Submitted By:

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Section 1: Basic Details

<table>
<tr><td>1.</td><td>NOS-Qualification Name</td><td colspan="2">Foundation of Artificial Intelligence Technology</td></tr>
<tr><td>2.</td><td>Sector</td><td colspan="2">IT-ITeS</td></tr>
<tr><td>3.</td><td>Type of Qualification ☒ New ☐ Revised</td><td>NQR Code & version of the existing /previous qualification: NA</td><td>Qualification Name of the existing/previous version: NA</td></tr>
<tr><td>4.</td><td>National Qualification Register (NQR) Code & Version</td><td>NG-3.5-IT-03724-2025-V1-NIELIT</td><td>5. NCrF/NSQF Level: 3.5</td></tr>
<tr><td>6.</td><td>Brief Description of the Standalone NOS</td><td colspan="2">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 apply skills independently. The participants will get initial exposure for developing AI models.</td></tr>
<tr><td>7.</td><td>Eligibility Criteria for Entry for a Student/Trainee/Learner/Employee</td><td colspan="2">a. Entry Qualification & Relevant Experience:
<table>
<tr><th>Academic/Skill Qualification (with Specialization - if applicable)</th><th>Required Experience (with Specialization - if applicable)</th></tr>
<tr><td>**Grade 10 pass and pursuing continuous schooling</td><td>No experience required</td></tr>
<tr><td>**Grade 8 with 2 years of NTC in the field of IT Sector</td><td>No experience required</td></tr>
<tr><td>**Grade 8th pass</td><td>3 Year relevant experience in IT</td></tr>
<tr><td>Previous NSQF Level 3 Required</td><td>1.5-year relevant experience in IT</td></tr>
</table>
** Should have a basic understanding of coding.</td></tr>
<tr><td>8.</td><td>Credits Assigned to this NOS-Qualification, Subject to Assessment (as per National Credit Framework (NCrF))</td><td>3 Credits</td><td>9. Common Cost Norm Category (I/II/III) (wherever applicable): Category-II</td></tr>
<tr><td>10.</td><td>Any Licensing Requirements for Undertaking Training on This Qualification (wherever applicable)</td><td colspan="2">NA</td></tr>
</table>

<table>
<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>35</td><td>55</td><td>90</td></tr></table>The mode of delivery shall be based on the regional demand and can be offered in any of the above modes mentioned.
(Refer Blended Learning Annexure-V for details)</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>100</td><td>60</td><td>20</td><td>20</td><td>200</td><td>50</td></tr></table>The centralised 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 NOS 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>Progression Path After Attaining the Qualification, wherever applicable (Please show Professional and Academic progression)</td><td>Academic:
Vertical:
Level 4: AI Development Associate

Professional:
AI Application Developer (AI)->Senior AI Application Developer (AI)-> AI Engineer-> Machine Learning Engineer -> AI Research Scientists</td></tr>
<tr><td>15.</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>
</table>

16.	**Other Indian languages in which the Qualification & Model Curriculum are being submitted**	Qualification file is available in English and Hindi languages.	
17.	**Is similar NOS available on NQR-if yes, justification for this qualification**	☐ **Yes** ☐ **No** **URLs of similar Qualifications:**	
18.	**Name and Contact Details Submitting / Awarding Body SPOC** *(In case of CS or MS, provide details of both Lead AB & Supporting ABs)*	**Name:** Sh. Ankit Kumar **Email:** patna@nielit.gov.in **Contact No.:** 6287942666 **Website:** https://www.nielit.gov.in	
19.	**Final Approval Date by NSQC: 18.02.2025**	**20. Validity Duration: 3 Years**	**21. 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)*	A-Level/MCA/ B. Tech in CS/IT/EC/EE/ allied areas with 1 years of experience of training in relevant field.
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	MCA/B-Level/B.Tech in CS/IT/EC/EE/ allied areas with an 2 years of experience/ 2 years of training in relevant field.
3.	**Tools and Equipment Required for Training**	☒Yes ☐No (*If "Yes", details to be provided in Annexure)*
4.	**In Case of Revised Qualification, Details of Any Upskilling Required for Trainer**	NA

Section 3: Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	A-Level/MCA/ B. Tech in CS/IT/EC/EE/ allied areas with 2 year of experience of training in relevant field.
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	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)*	Centralized online examination will be conducted
5.	**Tools and Equipment Required for Assessment**	☒ Same as for training ☐ Yes ☐ No *(details to be provided in Annexure-if it is different for Assessment)*

Section 4: Evidence of the Need for the Standalone NOS

Provide Annexure/Supporting documents name.

1.	Government /Industry initiatives/ requirement (Yes/No): Yes
2.	Number of Industry validation provided: The QF/NOS/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: 1000 persons per year shall be trained
4.	Evidence of Concurrence/Consultation with Line/State Departments (In case of regulated sectors): No NIELIT is recognized as an Adjudicating Body (AB) and Assessment Body (AA) under the Government category. NIELIT is the Human Resource Development (HRD) arm of MeitY

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)*	Available at Annexure-I: Evidence of Level
2.	**Annexure:** List of tools and equipment relevant for qualification *(Mandatory, except in case of online course)*	Available at Annexure-II: Tools and Equipment
3.	**Annexure:** Industry Validation	Available at Annexure-III: Industry Validation
4.	**Annexure: Training Details**	Available at Annexure-IV: Training Details
5.	**Annexure:** Blended Learning *(Mandatory, in case selected Mode of delivery is "Blended Learning")*	Available at Annexure-V: Blended Learning
6.	**Annexure/Supporting Document:** Standalone NOS- Performance Criteria Details Annexure/Document with PC-wise detailing as per NOS format (Mandatory- Public view)	Annexure-VI: Standalone NOS- Performance Criteria details
7.	**Annexure:** Detailed Assessment Criteria *(Mandatory)*	Available at Annexure-VII: Assessment Criteria

8.	**Annexure:** Assessment Strategy *(Mandatory)*	Available at Annexure-VIII: Assessment Strategy
9.	**Annexure:** Acronym and Glossary *(Optional)*	Available at Annexure-IX: Acronym and Glossary
10.	**Supporting Document:** Model Curriculum *(Mandatory – Public view)*	Available at Annexure-A: Model Curriculum

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	● Using AI tools ● Using python libraries for AI development ● Students will learn the concept of Neural network and will be able to train deep learning models as per the requirement ● Students will learn about implementing deep learning models for Computer vision and Natural Language Processing	● Possesses specialized operational knowledge and understanding of the work. ● Have complete knowledge of the concept of time required for delivery, and Quality for a range of issues	**3.5**
Professional and Technical Skills/ Expertise/ Professional Knowledge	● The candidate will be able to understand the basic concepts of AI, use cases, ethical practices of AI etc. ● Understand various types of models developed through AI ● The candidates will be able to understand the concepts of neural networks ● The students will be able to develop various kinds of deep learning models. ● The students will be able to work in OpenCV for analysis of images	● Possesses specialized professional and technical skills; displays clarity of professional knowledge and technical skills in a broad range of activities/ tasks ● Have knowledge of collecting and interpreting the available information, drawing conclusions & communicating the same	**3.5**

Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	● Career Development & Goal Setting ● Communication Skills ● Essential Digital Skills ● Getting Ready for Apprenticeship & Jobs	● Can explain Entrepreneurial Mindset and describe the importance of it in the context of opportunity curation for future jobs ● Can comfortably use most of the basic software with proficiency ● Have the ability to relate to the 5 pillars of Social Emotional Skills and describe the similarities between SES and Emotional Intelligence	**3.5**
Broad Learning Outcomes/Core Skill	● Deep learning models ● Working on image date through OpenCV ● Implementing NLP based application using NLTK Package	● Students can use, create, and design AI based innovative solutions ● Have knowledge of AI Application development and apply the understanding of deep learning models in improving solution	**3.5**
Responsibility	● Development of AI solutions ● Solving use cases using Deep learning models ● Realization of Projects in AI domains	Takes complete responsibility for delivery and quality of own work and output as also the subordinates.	**3.5**

Annexure II: 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	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

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. LCD Projector
2. Pin-up Board
3. White Board

Annexure III: Industry Validations Summary

* Course is to be offered through IndiaAi Labs for Empowering the youth by imparting training in Emerging AI Technologies under India AI Future Skills pillar of IndiaAI Mission.

Annexure IV: Training & Employment Details

Training Projections:

Year	Estimated Training # of Total Candidates	Estimated training # of Women	Estimated training # of People with Disability
2025-26	**1000**	**400**	**40**
2026-27	**1000**	**400**	**40**
2027-28	**1000**	**400**	**40**

Data to be provided year-wise for next 3 years.

Annexure V: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools:

Blended Learning Estimated Ratio & Recommended Tools:

S. No.	Select the Components of the Qualification	List Recommended Tools – for all Selected Components	Offline: Online Ratio
1	Theory/ Lectures - Imparting theoretical and conceptual knowledge	Online interaction platforms like JitSi Meet, Bharat VC, Google Meet, MS Teams, etc.	60:40

2	Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	NA	NA
3	Showing Practical Demonstrations to the learners	Online interaction platforms like JitSi Meet, Bharat VC, Google Meet, MS Teams, etc.	60:40
4	Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	PC/Laptop	60:40
5	Tutorials/ Assignments/ Drill/ Practice	Online interaction platforms like JitSi Meet, Bharat VC, Google Meet, MS Teams, etc.	50:50
6	Proctored Monitoring/ Assessment/ Evaluation/ Examinations	NIELIT Online Examination	Online: 100% Theory
7	On Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	NA	NA

Annexure VI: Performance Criteria details

1. Description:

The purpose of this qualification is to train the students in AI implementation using Python so as to upskill them and increase their employability in the field of IT/Computer Science. Purpose is to demystify AI and equip the future workforce with the confidence to learn and apply skills independently. The participants will get initial exposure for developing AI models.

2. Scope:

The scope covers the following:

- Enhances career prospects by preparing individuals for roles in artificial intelligence (AI) research, development, and implementation, including positions such as AI engineer, data scientist, and AI consultant.
- Equips participants with the skills to design, develop, and deploy AI solutions across various applications, making them valuable assets in industries that utilize AI technologies for automation, optimization, and innovation.
- Extends to opportunities in advanced AI domains such as machine learning, natural language processing, computer vision, robotics, and intelligent systems, requiring proficiency in AI technologies and methodologies.

3. Elements and Performance Criteria

Elements	Performance Criteria
Introduction to AI Concepts	PC1. Understand foundational AI concepts and applications. PC2. Work with Generative AI models.
Programming with Python for AI	PC3. Understand the Python ecosystem and programming fundamentals. PC4. Use Python modules and packages for machine learning.
Machine Learning Fundamentals	PC5. Perform data pre-processing and feature extraction. PC6. Analyze data using statistical and visualization techniques.
Introduction to Deep Learning	PC7. Develop neural networks for classification and anomaly detection. PC8. Gain experience with TensorFlow and PyTorch.
Natural Language Processing (NLP) Fundamentals	PC9. Perform NLP tasks using Python and NLTK. PC10. Apply text analysis, tokenization, and image processing for AI applications PC11. Implement object detection techniques.
Computer Vision Basics	PC12. Understand image processing techniques (filtering, edge detection, transformations). PC13. Implement image classification, object detection, and tracking. PC14. Develop robust computer vision models.
AI Model Deployment	PC15. Deploy AI models in cloud environments. PC16. Use Docker for model containerization and efficient deployment.

4. Knowledge and Understanding (KU):

The individual on the job needs to know and understand:

KU1: Fundamental principles of artificial intelligence, including concepts such as neural networks, reinforcement learning, and AI ethics.

KU2: Proficiency in using AI frameworks and libraries such as TensorFlow, OpenCV, NLTK, and OpenAI tools.

KU3: Techniques for data preprocessing, feature extraction, model training, and evaluation to ensure the development of effective and generalizable AI systems.

KU4: Theoretical and practical knowledge required to address challenges in AI projects, including issues like algorithmic fairness, model interpretability, and deployment in real-world scenarios.

5. Generic Skills (GS):

The user/individual on the job needs to know how to:

GS1: Follow instructions, guidelines, and procedures related to AI system development, deployment, and maintenance.

GS2: Communicate complex AI concepts, methodologies, and results effectively to both technical and non-technical stakeholders.

GS3: Apply problem-solving skills and critical thinking to address challenges in AI implementation, including debugging and optimizing AI models and systems.

Annexure VII: Assessment Criteria

Detailed assessment criteria for each NOS/Module are as follows:

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Foundation of Artificial Intelligence Technology **NOS Code: NIE/SSC/N1017**	**Overview of AI technology:**	14	8	3	3
	PC1. Understand foundational AI concepts and applications.	-	-	-	-
	PC2. Work with Generative AI models.	-	-	-	-
	Programming with Python for AI:	14	8	3	3
	PC3. Understand the Python ecosystem and programming fundamentals.	-	-	-	-
	PC4. Use Python modules and packages for machine learning.	-	-	-	-
	Machine Learning Fundamentals:	17	11	4	4
	PC5. Perform data pre-processing and feature extraction.	-	-	-	-
	PC6. Analyze data using statistical and visualization techniques.	-	-	-	-
	Introduction to Deep Learning:	14	8	3	3
	PC7. Develop neural networks for classification and anomaly detection.	-	-	-	-
	PC8. Gain experience with TensorFlow and PyTorch.	-	-	-	-
	Fundamentals of Natural Language Processing (NLP):	17	11	4	4
	PC9. Perform NLP tasks using Python and NLTK.	-	-	-	-

	PC10. Apply text analysis, tokenization, and image processing for AI applications	-	-	-	-
	PC11. Implement object detection techniques.	-	-	-	-
	Basics of Computer Vision:	14	8	2	2
	PC12. Understand image processing techniques (filtering, edge detection, transformations).	-	-	-	-
	PC13. Implement image classification, object detection, and tracking.	-	-	-	-
	PC14. Develop robust computer vision models.	-	-	-	-
	AI Model Deployment:	10	6	1	1
	PC15. Deploy AI models in cloud environments.	-	-	-	-
	PC16. Use Docker for model containerization and efficient deployment.	-	-	-	-
Grand Total		**100**	**60**	**20**	**20**

Annexure VIII: 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-IX: Acronym and 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.