**QUALIFICATION FILE- Micro Credential**

# Basics of Computer Vision

**☒ Public ☐ Private**

**☐ 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>Micro Credential -Qualification Name</td><td colspan="2">Basics of Computer Vision</td></tr>
<tr><td>2.</td><td>Sector</td><td colspan="2">IT-ITeS</td></tr>
<tr><td>3.</td><td>National Qualification Register (NQR) Code & Version</td><td>NM-3.5-IT-03825-2025-V1-NIELIT</td><td>4. NCrF/NSQF Level: 3.5</td></tr>
<tr><td>5.</td><td>Brief Description of the Micro Credential</td><td colspan="2">The purpose of this qualification is to train the students in Computer vision so that students may implement computer vision algorithms for image classification, object detection, and tracking 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>6.</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>**10th with pursuing continuous schooling</td><td>No Experience required</td></tr>
<tr><td>**8th with 2 years of NTC in the field of IT Sector</td><td>No Experience required</td></tr>
<tr><td>** 8th</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>7.</td><td>Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))</td><td>0.5 Credits</td><td>8. 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:<br>Upon completing the "Introduction to Computer Vision Basics" course, learners will gain practical skills in image processing and object detection techniques. They will understand the foundational concepts of computer vision, key image processing</td></tr>
</table>

<table>
<tr><td></td><td></td><td colspan="2">techniques, and basic object detection methods. Learners will set up the Python environment and utilize key libraries like OpenCV.</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 colspan="2">☒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>5</td><td>10</td><td>15</td></tr>
</table></td></tr>
<tr><td>12.</td><td>Assessment Criteria</td><td colspan="2">
<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>0</td><td>0</td><td>0</td><td>50%</td></tr>
</table>
The centralized online assessment is conducted by the Examination Wing, NIELIT Headquarters.<br>* 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 colspan="2">☒ Yes ☐ No<br>a. Locomotor Disability: Leprosy Cured Person, Dwarfism, Muscular Dystrophy and Acid Attack Victims<br>b. Visual Impairment: Low Vision</td></tr>
<tr><td>14.</td><td>How participation of women will be encouraged?</td><td colspan="2">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 Micro Credential will be implemented.</td><td colspan="2">Qualification file is available in English and Hindi languages.</td></tr>
<tr><td>16.</td><td>Is similar Micro Credential available on NQR-if yes, justification for this qualification</td><td colspan="2">☐ Yes ☒ No URLs of similar Qualifications:</td></tr>
<tr><td>17.</td><td>Name and Contact Details Submitting / Awarding Body SPOC</td><td colspan="2">Name: Sh. Ankit Kumar<br>Email: patna@nielit.gov.in<br>Contact No.: 6287942666<br>Website: https://www.nielit.gov.in</td></tr>
<tr><td>18.</td><td>NSQC Approved Date: 18.02.2025</td><td>19. Validity Duration: 3 Years</td><td>20. Next Review Date: 18.02.2028</td></tr>
</table>

**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 in training. |
| 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 experience of 2 years in training |
| 3. | **Tools and Equipment Required for Training** | ☒Yes ☐No (*If "Yes", details to be provided in Annexure)* |

**Section 3: Assessment Related**

| | | |
|---|---|---|
| 1. | **Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)* | MCA/B-Level/B.Tech in CS/IT/EC/EE/ allied areas with an experience of 2 years in training |
| 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 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 Check List

*Specify Annexure Number and 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** | ● Computer vision and its applications<br>● Image processing techniques<br>● Feature extraction and preprocessing<br>● Students will learn about implementing deep learning models for Computer vision | ● Possesses specialized operational knowledge and understanding of the work.<br>● 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** | ● Understand various types of computer vision models developed through OpenCV<br>● 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<br>● 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<br>● Communication Skills<br>● Essential Digital Skills<br>● Getting Ready for Apprenticeship & Jobs | ● Can explain Entrepreneurial Mindset and describe the importance of it in the context of opportunity curation for future jobs<br>● Can comfortably use most of the basic software with proficiency<br>● 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** | ● Working on image date through OpenCV<br>● Familiarity with tools and libraries like OpenCV, Scikit-image, and YOLO. | ● Students can use, create, and design AI based innovative solutions<br>● Have knowledge of AI Application development and apply the understanding of deep learning models in improving solution | 3.5 |
| **Responsibility** | ● Development of AI solutions<br>● Solving use cases using Deep learning models<br>● 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: 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 |
|---|---|---|---|
| Conceptualizing AI | Fundamentals of AI, structure and components of AI systems, Generative AI | 25 | 25 |
| Training AI models | Python programming fundamentals, Python libraries for ML, Machine learning fundamentals, ML algorithms, Neural networks, Artificial Neural Networks (ANN) and Convolutional Neural Networks (CNN) | | |
| AI applications development and deployment | Natural Language Processing (NLP), Natural Language Understanding (NLU) concepts and applications, Using NLTK, computer vision and its applications, image processing techniques: analysis, preprocessing, and edge detection, Simple object detection (e.g., face/eye detection), Fundamentals of model deployment, Introduction to MLOps, deploying AI models on cloud platforms | | |
| **Grand Total** | | | |

## 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 | 30 |
| 3 | Student Table | 30 | 30 |
| 4 | Desktop computer with accessories | • 12th Generation Intel® Core™ i5-12500T with Intel vPro® Enterprise<br>• 8 GB DDR4-3200 MHz RAM (1 x 8 GB)<br>• 512 GB PCIe® NVMe™ M.2 SSD<br>• Intel® UHD Graphics 770<br>• Windows 11 Professional | 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 V: Blended Learning

**Blended Learning Estimated Ratio & Recommended Tools:**

| S. No. | Select the Components of the NOS | 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 | Online interaction platforms like JitSi Meet, Bharat VC, Google Meet, MS Teams, etc. | 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 Remote Proctored Software | Online: 100% Theory; Offline 100% Practical |
| 7 | □ On the Job Training (OJT)/ Project Work Internship/ Candidate Training | NA | NA |

## Annexure-VI: 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 |
|---|---|
| **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. |