QUALIFICATION FILE – Micro Credentials

Introduction to Data Analysis Concepts and Techniques

☐ 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">Introduction to Data Analysis Concepts and Techniques</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-3.5-IT-03828-2025-V1-NIELIT</td><td>4. NCrF/NSQF Level: 3.5</td></tr>
<tr><td>5.</td><td>Brief Description of the Micro Credentials</td><td colspan="2">The course “Introduction to Data Analysis Concepts and Techniques” provides a comprehensive introduction to essential methods used in data science. Participants will learn to perform Exploratory Data Analysis (EDA) and create effective visualizations using Matplotlib and Seaborn. The course also covers statistical analysis, time series analysis, and the application of probability concepts in data science. In addition, learners will be introduced to Natural Language Processing (NLP) techniques for sentiment analysis and text classification. Through practical sessions, the course equips participants with the skills to analyze, interpret, and derive meaningful insights from diverse datasets.</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>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 of experience in relevant field of IT.</td></tr>
<tr><td>Previous relevant Qualification of NSQF Level 3</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>1 Credit</td><td>8. Common Cost Norm Category (I/II/III) (wherever applicable): Category-II</td></tr>
</table>

<table>
<tr><td>9.</td><td>Any Licensing Requirements/Pre-requisites for Undertaking Training (wherever applicable)</td><td>No</td></tr>
<tr><td>10.</td><td>Expected Outcomes of the Micro Credential</td><td>Terminal learning outcomes are:
After completion of the module, the students shall be able to:

● Demonstrate the ability to explore, visualize, and interpret datasets using Python-based data analysis tools.
● Analyze data using statistical methods, probability concepts, and time series techniques to derive meaningful insights.
● Apply Natural Language Processing (NLP) techniques for performing sentiment analysis and text classification tasks.</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 Only ☐Online Only ☐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 If “Yes”, specify applicable type of Disability:
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>
</table>

15.	**Other Indian languages in which the Micro Credential will be implemented.**	Qualification file is available in English and Hindi languages.	
16.	**Is similar Micro Credential Qualification(s) available on NQR-if yes, justification for this qualification**	**☐ Yes ☒ No URLs of similar Qualifications:**	
17.	**Name and Contact Details Submitting / Awarding Body SPOC**	**Name:** Shri Binoy Das **Email:** erbinoy@nielit.gov.in **Contact No.:** 9436585656 **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 requirement and NCVET guidelines)	A-Level/MCA/ B. Tech in CS/IT/EC/EE/ allied areas with 1 years of experience in training in relevant field.
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** (as per requirement and NCVET guidelines)	MCA/B-Level/B.Tech in CS/IT/EC/EE/ allied areas with 2 years of experience/ 2 years of training in relevant field.
3.	**Tools and Equipment Required for the 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 requirement and 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 requirement and 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 requirement and 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 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	Understanding of core concepts in data analysis including Exploratory Data Analysis (EDA), data visualization, statistical methods, probability, and Natural Language Processing (NLP).	The learner demonstrates theoretical understanding of basic analytical processes and methods used in data interpretation and visualization, consistent with Level 3.5 knowledge depth.	3.5
Professional and Technical Skills/ Expertise/ Professional Knowledge	Ability to perform EDA, visualize datasets using Matplotlib and Seaborn, apply statistical and time series analysis, and implement NLP for sentiment analysis and text classification.	The learner applies standard analytical tools and techniques to solve data-driven problems, demonstrating technical proficiency typical of Level 3.5 professional skill.	3.5
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	Ability to use open-source analytical tools (Python, Jupyter Notebook, Anaconda) for real-world data tasks and effectively communicate analytical results.	The learner develops analytical thinking, problem-solving ability, and digital readiness for entry-level data-related roles, aligning with Level 3.5 employability and professional expectations.	3.5
Broad Learning Outcomes/Core Skill	Apply data analysis techniques to derive insights, interpret datasets, and communicate results through visual representation.	The learner demonstrates comprehension, communication, and analytical reasoning consistent with Level 3.5 core learning outcomes.	3.5
Responsibility	Work under supervision to carry out data analysis and reporting tasks using standard tools and techniques.	The learner performs assigned analytical tasks responsibly and independently within defined parameters, aligning with Level 3.5 responsibility descriptors.	3.5

Annexure-II: Assessment Criteria

Detailed PC-wise assessment criteria and assessment marks for the NOS are as follows:

Performance Criteria	Assessment Criteria for Performance Criteria	Theory Marks	Practical Marks
PC 1.	Understand the dataset and perform data cleaning and preprocessing.	25	25
PC 2.	Generate summary statistics and identify patterns or anomalies in data.		
PC 3.	Create visual representations using Matplotlib and Seaborn to communicate findings.		
PC 4.	Apply measures of central tendency, dispersion, and correlation on datasets.		
PC 5.	Implement probability concepts to interpret data outcomes.		
PC 6.	Perform basic time series analysis for trend identification and forecasting.		
PC 7.	Preprocess and clean textual data for analysis.		
PC 8.	Apply NLP methods for feature extraction (tokenization, stemming, stopword removal, etc.).		
PC 9.	Develop and test sentiment analysis or text classification models using suitable Python libraries.		
	Total Marks	**25**	**25**
	Grand Total	**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: 20

S. No.	**Tool / Equipment Name**	**Specification**	**Quantity for specified Batch size**
1	Classroom	1 (30 Sq.m)	20
2	Student Chair	Standard	20
3	Student Table	Standard	20
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 ● Pre-installed Anaconda Distribution, Jupyter Notebook, Python (latest version), NumPy, Pandas, Matplotlib, Seaborn, Scikit-learn, NLTK	20
5	Desk jet printer	A4	1 No.

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

Annexure-V: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools**: 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
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.