Qualification File– Micro Credentials

Overview of Data Science

☒ Public ☐ Private

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

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

NCrF/NSQF Level: 3

Submitted By:

National Institute of Electronics and Information Technology (NIELIT)
NIELIT Bhawan,
Plot No. 3, PSP Pocket, Sector-8,
Dwarka, New Delhi-110077,
Phone: - 91-11-2530 8300
e-mail: - contact@nielit.gov.in

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Section 1: Basic Details

<table>
<tr><td>1.</td><td>Micro Credential-Qualification Name</td><td colspan="2">Overview of Data Science</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</td><td>NM-03-IT-03826-2025-V1-NIELIT</td><td>4. NCrF/NSQF Level: 3</td></tr>
<tr><td>5.</td><td>Brief Description of the MicroCredentials</td><td colspan="2">The “Overview of Data Science” course provides a comprehensive introduction to the core concepts and practices of data science. It begins by defining data science, highlighting its scope, and exploring its applications across industries. Participants will learn to distinguish data science from related fields such as data analytics and machine learning, gaining clarity on their unique roles.</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>S. 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 9 pass and pursuing continuous schooling in regular school.</td><td>No experience required</td></tr>
<tr><td>3</td><td>**Grade 8th Pass with 2 years 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>0.25 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">No</td></tr>
</table>

<table>
<tr><td>10.</td><td>Expected Outcomes of the Micro Credential</td><td>Terminal learning outcomes are:
Explain the definition, scope, and applications of data science.
Differentiate between data science, data analytics, and machine learning.
Demonstrate an understanding of the data science workflow, including data acquisition, preprocessing, EDA, modeling, and deployment.</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>4</td><td>3.5</td><td>7.5</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>ES/Internal Assessment (Marks)</th><th>Project/OJT (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 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 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>
<tr><td>15.</td><td>Other Indian languages in which the Qualification & Model Curriculum are being submitted</td><td>Qualification file is available in 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: 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 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 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 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), (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)*	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 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: 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	This qualification prepares individuals for data science roles with expertise in Python/R programming, data preprocessing, and machine learning techniques. Graduates will gain hands-on experience through real-world case studies, mastering tools like Pandas, Matplotlib, and Jupyter while solving industry-specific problems. Emphasis on ethical practices and data privacy ensures readiness for roles like Data Analyst.	The job role and outcomes align with NCrF/NSQF Level 4 or 5, emphasizing advanced theoretical knowledge and practical skills in data science and analytics. Learners are equipped to independently handle complex datasets, solve real-world problems, and apply machine learning techniques while adhering to ethical standards. These competencies reflect the level descriptors' focus on specialized knowledge, analytical skills, and professional accountability across diverse industries.	3

Professional and Technical Skills/ Expertise/ Professional Knowledge	The qualification equips individuals with professional and technical expertise in programming languages like Python and R, alongside data manipulation and analysis using tools such as NumPy, Pandas, and Jupyter Notebook. Graduates gain proficiency in data preprocessing techniques, statistical analysis, data visualization with Matplotlib and Seaborn, and machine learning algorithms like regression, clustering, and hyperparameter tuning. Advanced knowledge includes exploratory data analysis (EDA), model validation, natural language processing (NLP), and time series analysis. Additionally, learners develop domain-specific skills for applications in finance, healthcare, and e-commerce, while emphasizing ethical data handling and privacy practices to ensure responsible and secure professional practice.	Factual knowledge of field of knowledge or study.	3
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	This qualification prepares learners for employment readiness by equipping them with in-demand skills in programming, data analysis, and machine learning, enabling them to take on roles like Data Analyst. Through hands-on projects and case studies, they develop problem-solving abilities, innovation, and effective communication, ensuring they can independently manage real-world data challenges. Additionally, the program fosters an entrepreneurial mindset, encouraging learners to identify opportunities for data-driven innovation while emphasizing ethical practices and collaboration in professional environments.	Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts	3
Broad Learning Outcomes/Core Skill	They will be able to handle alone as well as in /with the team in the area as per the curriculum	Language to communicate written or oral, with required clarity, skill to basic arithmetic and algebraic principles, basic understanding of social political and natural environment.	3
Responsibility	Graduates of this qualification are equipped to take on significant responsibilities, including independently managing data science projects from data acquisition and preprocessing to model development and deployment. They are responsible for ensuring data quality, performing in-depth analyses, and deriving actionable insights while adhering to ethical	Responsibility for own work and learning.	3

	standards and data privacy regulations. Additionally, they are expected to effectively communicate findings, collaborate with interdisciplinary teams, and contribute to decision-making processes in organizational or entrepreneurial settings, showcasing accountability and professional integrity in their roles.		

Annexure-II: Assessment Criteria

Performance Criteria	Assessment Criteria for Performance Criteria	Theory Marks	Practical Marks
PC 1.	Understand foundational data science concepts, differentiate core data-related fields, describe the stages of the data science process, and gain hands-on experience with data loading and inspection using Python or R.	25	25
PC 2.	Develop programming skills in Python/R for data analysis, utilize libraries for data manipulation and analysis, apply preprocessing techniques to datasets, and gain proficiency in data analytics tools for structured data manipulation.		
PC 3.	Perform exploratory data analysis (EDA) on real-world datasets, create insightful data visualizations, understand statistical analysis and probability, build and evaluate foundational machine learning models, and gain proficiency in data analytics tools for structured data manipulation.		
PC 4.	Implement various machine learning algorithms for prediction and analysis, apply feature engineering and selection techniques, perform model validation and optimization, gain hands-on experience with NLP and time series analysis for specialized applications, and achieve proficiency in data analytics tools for structured data manipulation.		
PC 5.	Analyze real-world data science applications, identify ethical considerations and best practices in data handling, engage in team-based case study analysis, practice data-driven decision-making, and gain proficiency in data analytics tools for structured data manipulation.		
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: 20

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	Classroom	1 (30 Sq.m)	20
2	Student Chair	30	20
3	Student Table	30	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	20
5	Desk jet printer	1 No.	A4

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: Training Details

Year	Estimated Training# of Total Candidates	Estimated training # of Women	Estimated training # of people with Disability
2025-26	100	50	10
2026-27	200	70	15
2027-28	200	70	15

Annexure-VI: Blended Learning

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

Annexure-VII: 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.