QUALIFICATION FILE–Standalone NOS

New Technologies Introduction

☐ 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: 5

Submitted By:

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Section 1: Basic Details

1.	**NOS-Qualification Name**	**New Technologies Introduction**	
2.	**Sector/s**	**IT-ITeS**	
3.	**Type of Qualification ☒ New ☐ Revised**	**NQR Code & version of the existing /previous qualification: NA**	**Qualification Name of the existing/previous version: NA**
4.	**National Qualification Register (NQR) Code & Version**	NG-05-IT-01430-2023-V1-NIELIT	**5. NCrF/NSQF Level: 5**
6.	**Brief Description of the Standalone NOS**	This course encompasses a broad spectrum of topics that lay the foundation for professionals entering the dynamic realm of emerging technologies. It begins with a fundamental exploration of AI basics, delving into its applications across industries. The course goes beyond the positive aspects, addressing potential challenges by examining frauds facilitated by AI. It then ventures into the critical domain of cybersecurity, exploring AI's role in both potential threats and defensive strategies. A focus on generative models sheds light on the creative potential of AI. Shifting gears, the course introduces blockchain technology, covering its fundamentals and diverse applications. It extends into the realm of quantum computing, providing a fundamental understanding of this transformative technology. Automation takes center stage, with insights into security automation, incident response plans, and future trends, preparing participants for the integration of these technologies into their professional landscapes.	

<table>
<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>S. No.</th><th>Academic/Skill Qualification (with Specialization - if applicable)</th><th>Relevant Experience (with Specialization - if applicable)</th></tr>
<tr><td>1</td><td>Pursuing^ Final Year B.Tech in any branch of Engineering*

Or

Pursuing^ Final Year MCA
Or

Pursuing^ Final Year B.Sc. in any branch of Sciences*
Or

Pursuing^ Final Year B.Sc. in IT/CS/Electronics/allied subjects

*Students should have relevant knowledge of the Networking and programming concepts.

#Students with the above entry requirements are eligible to take the course subject to clearing the written test comprising of Analytical Reasoning, Mathematics and English

^Passout students in the above entry requirements are also eligible for the course.</td><td>NA</td></tr>
</table>
b. Age: 21 Years</td></tr>
<tr><td>8.</td><td>Credits Assigned to this NOS-Qualification, Subject to Assessment (as per National Credit Framework (NCrF))</td><td>2</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">Not Applicable</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 Mode</th><th>Theory (Hours)</th><th>Practical (Hours)</th><th>Total (Hours)</th></tr><tr><td>Classroom (offline)</td><td>30</td><td>30</td><td>60</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.</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>0</td><td>0</td><td>0</td><td>100</td><td>50</td></tr></table>The centralised online assessment is conducted by the Examination Wing, NIELIT Headquarters.</td></tr>
<tr><td>13.</td><td>Is the NOS 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>Progression Path After Attaining the Qualification, wherever applicable</td><td>Technology Consultant
Systems Analyst
AI Developer
Blockchain Developer
Technology Strategist</td></tr>
<tr><td>15.</td><td>How will the participation of women 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>16.</td><td>Other Indian languages in which the Qualification & Model Curriculum are being submitted</td><td>Qualification files available in English & Hindi Language.</td></tr>
</table>

17.	**Is similar NOS available on NQR-if yes, justification for this qualification**	**☐Yes ☒ No**	
18.	**Name and Contact Details Submitting / Awarding Body SPOC** *(In the case of CS or MS, provide details of both Lead AB & Supporting ABs)*	A. Name: SHRI NILADRI DAS Position in the organization: Scientist E Address: NIELIT Agartala Tel number(s): 8794028299 E-mail address: niladridas@nielit.gov.in B. Name: SHRI BINOY DAS Position in the organization: Senior Technical Officer Address: NIELIT Agartala Tel number(s): 8794822459 E-mail address: erbinoy@nielit.gov.in	
19.	**Final Approval Date by NSQC: 30/11/2023**	**20. Validity Duration: 3 years**	**21. Next Review Date: 30/11/2026**

Section 2: Training Related

1.	**Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)**	B.Tech or Equivalent as per NCrF with 15+ years of experience
2.	**Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)**	B.Tech or Equivalent as per NCrF with 15+ years of experience
3.	**Tools and Equipment Required for the Training**	☒ Yes ☐No Available at Annexure-II
4.	**In Case of Revised NOS, details of Any Upskilling Required for Trainer**	Not Applicable

Section 3: Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	B.Tech or Equivalent as per NCrF with 15+ years of experience
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 comprises 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

Section 4: Evidence of the Need for the Standalone NOS

1.	Government /Industry initiatives/ requirement (Yes/No): Yes.
2.	Number of Industry validation provided: 4
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 recognised as AB and AA under the Government Category. NIELIT is the HRD arm of MeitY, GoI.

Section 5: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	**Annexure:** NCrF/NSQF level justification based on NCrF/NSQF descriptors *(Mandatory)*	*Available at* Annexure-I: Evidence of Level
2.	**Annexure:** List of tools and equipment relevant for NOS *(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 the 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)	*Available at* Annexure-VI: Performance Criteria
7.	**Annexure:** Performance and Assessment Criteria *(Mandatory)*	*Available at* Annexure-VII: Detailed 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	*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	This comprehensive course covers a spectrum of technology domains, starting with foundational knowledge in AI, exploring its basics, applications, and the potential risks, such as frauds using AI. Delving into cybersecurity, it delves into AI's role in cyber defense, emphasizing the importance of understanding generative models. Shifting to blockchain technology, the course introduces its fundamentals, applications, and the transformative potential of decentralized ledgers. It further explores the complex realm of quantum computing, offering insights into its fundamentals. The course concludes by addressing the critical aspects of automation, including security automation, incident response plan automation, and an exploration of future trends and integration possibilities, providing a holistic understanding of cutting-edge technologies shaping the digital landscape.	This course is aligned with higher NSQF/NCrF levels, indicating a need for advanced theoretical knowledge and practical application in the specialized field of FutureSkills Technologies.	5
Professional and Technical Skills/ Expertise/ Professional Knowledge	Professionals completing this course will develop a diverse set of technical and professional skills spanning various technology domains. They will acquire technical proficiency in understanding AI fundamentals, applications, and the implications of AI in cybersecurity, including its role in defense and potential risks like fraudulent activities. Additionally, participants will gain skills in comprehending generative models, blockchain technology, and its applications, with a focus on decentralized ledgers. The course equips individuals with foundational knowledge in quantum computing and explores the intricacies of automation, emphasizing security automation and incident response plan automation. Professionals will emerge with a comprehensive skill set, ready to navigate and contribute to the ever-evolving landscape of new technologies and their multifaceted applications.	Individuals completing this qualification are likely to possess the expertise required for roles demanding advanced and specialized knowledge in the field of FutureSkills Technologies.	5

Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	The course encompasses essential employment readiness and entrepreneurship skills by providing participants with a multifaceted understanding of transformative technologies. Learners gain foundational knowledge in AI, blockchain, and quantum computing, enhancing their employability in industries undergoing digital transformation. The exploration of fraud detection using AI, cybersecurity, generative models, and automation hones practical skills applicable to contemporary job roles. Additionally, insights into future trends empower individuals with an entrepreneurial mindset, fostering adaptability and innovation in the ever-evolving landscape of emerging technologies. This course not only prepares participants for roles in technology-driven industries but also cultivates an entrepreneurial spirit, enabling them to navigate and contribute meaningfully to the dynamic world of innovative technologies.	Candidates will be learning effective communications which will make them smart in communicating with various companies and people.	5
Broad Learning Outcomes /Core Skill	This comprehensive course delivers broad learning outcomes by equipping participants with a versatile skill set in emerging technologies. Beginning with a solid foundation in AI, participants gain an understanding of its basics, applications, and potential challenges such as frauds. The course extends to cybersecurity, exploring the role of AI in defense. Participants delve into blockchain technology, learning its fundamentals and diverse applications, while also acquiring insights into the revolutionary field of quantum computing. The course concludes with a focus on automation, covering security automation and incident response plan automation, preparing participants for the future with a nuanced understanding of key technologies, their applications, and the evolving landscape of digital innovation.	Candidate can perform well under supervision of team lead	5
Responsibility	The responsibility of the comprehensive course lies in equipping participants with a well-rounded understanding of transformative technologies, spanning AI, blockchain, quantum computing, and automation. It aims to foster a deep awareness of both the opportunities and challenges presented by these technologies, empowering individuals to contribute meaningfully to their respective fields and navigate the evolving landscape of digital innovation responsibly.	Takes complete responsibility for delivery and quality of own work and output as also the subordinates. Shares responsibility for the group tasks.	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	Students Chair	30	30
3	Students Table	30	30
4	Desktop computer with accessories	GUI based Operating System, Jupyter Notebooks or RStudio pandas (Python) or dplyr (R) Matplotlib/Seaborn (Python) or ggplot2 (R), SQLite or MySQL, Tableau or Power BI, Slack, Google Colab, Kaggle, TensorFlow or PyTorch, NLTK (Python) or tm (R), QGIS or ArcGIS	30
5	Deskjet printer	1 No.	Paper-A4

Classroom Aids for offline and blended mode of training:

The aids required to conduct sessions in the classroom are:

1. LCD Projector/Smart Board
2. Pin-up Board
3. WhiteBoard, Markers

Annexure III: Industry Validations/ Government Recognition Summary

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID
1	Software World	Amrita Saha	Proprietor	Ujan Abhoynagar, Manipuripara, Agartala, Tripura(West)	7005261744	support@softwareworld.Co.In
2	Bada Biplab Power Solution LLP	Iduli Debbarma	Designated Partner	Agartala West Tripura, Pin: 799003	9436740983	bbpsllp@gmail.com
3	Krishna Industrial Services	Debajit Dey	Proprietor	Badharghat Chowmuhani Agartala, Pin: 799003	9862770077	jbyacademy@gmail.com
4	JB Youth Computer Solution & Educational Society	Nishi Kanta Das	Project Coordinator	Badharghat Chowmuhani, Siddi Ashram, Agartala	9436740983	jbyacademy@gmail.com

Annexure IV : Training Details

Training Projections:

Year	Estimated Training # of Total Candidates	Estimated training# of Women	Estimated training# of People with Disability
2023-24	1000	200	20
2024-25	1000	200	20
2025-26	1000	200	20

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

Annexure V: Blended Learning

Blended Learning Estimated Ratio &Recommended Tools:

Refer NCVET "Guidelines for Blended Learning for Vocational Education, Training & Skilling" available on:

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	PCs/Laptops	100:0
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 the Job Training (OJT)/ Project Work Internship/ Candidate Training	NA	NA

Annexure VI : Standalone NOS- Performance Criteria details

1. **Description:**
   The "New Technologies Introduction" course provides a comprehensive exploration of cutting-edge technologies, spanning AI, blockchain, quantum computing, and automation. Participants gain theoretical knowledge and practical insights into the applications, potential risks, and future trends of these technologies, enabling them to navigate and contribute to the dynamic landscape of emerging innovations.

2. Scope:

The scope covers the following:

- Providing participants with essential knowledge and understanding of emerging technologies, including AI, blockchain, quantum computing, and automation. This scope enables learners to grasp the fundamental principles, applications, and implications of these technologies.
- Its scope to practical applications, allowing participants to explore and apply the acquired knowledge in real-world scenarios. This includes understanding how AI can be utilized in various domains, exploring blockchain applications, and delving into hands-on experiences with automation and quantum computing, enhancing participants' proficiency in these areas.
- Encompasses a strategic scope by providing insights into the strategic implications of these technologies and anticipating future trends. Participants gain an understanding of how these innovations can shape industries, impact cybersecurity, and drive automation trends. This strategic perspective empowers learners to make informed decisions and contribute to the strategic direction of their organizations in the face of evolving technological landscapes.

3. Elements and Performance Criteria

Elements	Performance Criteria
Artificial Intelligence and its Applications in Cybersecurity	PC1: Demonstrates the ability to identify and articulate diverse applications of artificial intelligence (AI) across various industries, showcasing a comprehensive understanding of how AI is employed to address real-world challenges and enhance processes. PC2: Exhibits proficiency in recognizing and mitigating frauds facilitated by AI, showcasing an understanding of fraudulent techniques that leverage AI algorithms and demonstrating the capability to implement effective countermeasures. PC3: Demonstrates proficiency in integrating AI into cybersecurity practices by deploying AI-driven tools and implementing strategies for detecting threats, assessing vulnerabilities, and responding to incidents.
Blockchain Technology And Quantum Computing	PC1: Demonstrates a comprehensive understanding of blockchain technology, including its fundamental principles, structures, and cryptographic mechanisms. Additionally, showcases the ability to identify and articulate real-world applications of blockchain across various industries. PC2: Exhibits proficiency in quantum computing fundamentals, illustrating a grasp of quantum mechanics principles, quantum bits (qubits), and the potential advantages and challenges associated with quantum computing. PC3: Demonstrates the ability to implement security automation, showcasing skills in designing and deploying automated security measures to enhance the overall cybersecurity posture. PC4: Displays competence in automating incident response plans, including the ability to design, implement, and optimize automated processes for efficiently addressing and mitigating security

	incidents. PC5: Exhibits awareness of current and future trends in emerging technologies, with a focus on how blockchain, quantum computing, and automation will integrate into the evolving landscape. Demonstrates the ability to anticipate industry shifts and strategically plan for technology integration.

4. Knowledge and Understanding (KU):

The individual on the job needs to know and understand:

KU1: The course provides foundational Knowledge and Understanding in AI, covering basics, applications, and the role of AI in cybersecurity, with a focus on fraud detection using AI and the principles of generative models.

KU2: Participants gain insights into Blockchain Technology, understanding its fundamentals and exploring diverse applications in various industries.

KU3: Quantum Computing Fundamentals are introduced, providing learners with a theoretical understanding of the principles behind quantum computing.

KU4: The course delves into Automation and Security Automation, emphasizing the importance of automating processes and incident response plans to enhance cybersecurity.

KU5: Future Trends and Integration are discussed, ensuring participants are equipped with knowledge to anticipate and integrate emerging technologies into their professional domains.

5. Generic Skills (GS):

User/individual on the job needs to know how to:

GS1. Follow instructions, guidelines and procedures

GS2. Listen effectively and communicate information accurately

GS3. Apply formatting features to achieve the desired results

Annexure VII: Assessment Criteria

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

S. No.	Assessment Criteria for Performance Criteria	Theory Marks	Practical Marks	Project Marks	Viva Marks
Artificial Intelligence and its Applications in Cybersecurity	PC1: Demonstrates the ability to identify and articulate diverse applications of artificial intelligence (AI) across various industries, showcasing a comprehensive understanding of how AI is employed to address real-world challenges and enhance processes. PC2: Exhibits proficiency in recognizing and mitigating frauds facilitated by AI, showcasing an understanding of fraudulent techniques that leverage AI algorithms and demonstrating the capability to implement effective countermeasures. PC3: Demonstrates proficiency in integrating AI into cybersecurity practices by deploying AI-driven tools and implementing strategies for detecting threats, assessing vulnerabilities, and responding to incidents.	50	-	-	-
Blockchain Technology And Quantum Computing	PC1: Demonstrates a comprehensive understanding of blockchain technology, including its fundamental principles, structures, and cryptographic mechanisms. Additionally, showcases the ability to identify and articulate real-world applications of blockchain across various industries. PC2: Exhibits proficiency in quantum computing fundamentals, illustrating a grasp of quantum mechanics principles, quantum bits (qubits), and the potential advantages and challenges associated with quantum computing. PC3: Demonstrates the ability to implement security automation, showcasing skills in designing and deploying automated security measures to enhance the overall cybersecurity posture. PC4: Displays competence in automating incident response plans, including the ability to design, implement, and optimize automated processes for efficiently addressing and mitigating security incidents. PC5: Exhibits awareness of current and future trends in emerging technologies, with a focus on how blockchain, quantum computing, and automation will integrate into the evolving landscape. Demonstrates the ability to anticipate industry shifts and strategically plan for technology integration.	50	-	-	-
	Total Marks	**100**	**-**	**-**	**-**

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.