# QUALIFICATION FILE

## AI- Data Architect

☒ **Short Term Training (STT)** ☐ **Long Term Training (LTT)** ☐ **Apprenticeship**

☒ **Upskilling** ☐ **Dual/Flexi Qualification** ☐ **For ToT**

☐ **For ToA**

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

**NCrF/NSQF Level: 7**

**Submitted By: Namrata Kapur**

**IT-ITeS Sector Skills Council NASSCOM (SSC NASSCOM)**
**Plot No. – 7, 8, 9 & 10**
**Sector – 126, Noida, Uttar Pradesh - 201303**

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AI- Data Architect

# Section 1: Basic Details

| 1. | Qualification Name | AI- Data Architect | |
|---|---|---|---|
| 2. | Sector/s | IT/ITeS | |
| 3. | Type of Qualification:  ☐ New  ☒ Revised  ☒ Has Electives/Options  ☐ OEM | NQR Code & version of the existing /previous qualification: *2020/ITES/ITSSC/04327 & Version 2* | Qualification Name of the existing/previous version: AI- Data Architect |
| 4. | a.   OEM name<br>b.   Qualification Name *(Wherever applicable)* | *AI- Data Architect* | |
| 5. | National Qualification Register (NQR) Code &Version<br>(*Will be issued after NSQC approval*) | *QG-06-IT-01528-2023-V1.1-NASSCOM & Version 3* | 6.   NCrF/NSQF Level: 7 |
| 7. | Award (Certificate/Diploma/Advance Diploma/ Any Other)<br>(*Wherever applicable specify multiple entry/exits also & provide details in annexure*) | Certificate | |
| 8. | Brief Description of the Qualification | Individuals at this job must be responsible for designing and implementing the component specifications of various elements of data architecture such as databases, data warehouses, data lakes and data pipelines. They are also responsible for updating and migrating the data architecture based on standards and the organization's requirements. They need to be well organized with excellent critical thinking and decision making abilities. They need to have superior team management and communication skills to work with customers and decision makers across multiple teams. | |
| 9. | Eligibility Criteria for Entry for a Student/Trainee/Learner/Employee | a.   **Entry Qualification & Relevant Experience/ field:**<br>*Relevant Experience in job roles related to IT/AI/Big Data Analytics/Programming<br>The relevant experience would include work, internship, and apprenticeship after completing relevant educational qualifications.<br>** PHD or PG or UG or diploma with courses related to Engg./ Science | |

AI- Data Architect

| S. No. | Academic/Skill Qualification (with Specialization - if applicable) | Required Experience (with Specialization - if applicable) |
|---|---|---|
| 1 | Pursuing PhD in relevant field** | - |
| 2 | Pursuing 2nd year of 2-year PG** | - |
| 3 | Completed 4 Year UG degree with honours/honours with research | 2 years of relevant experience* |
| 4 | Previous Relevant qualification of NSQF level 6 | 3 years of relevant experience* |

    **b. Age: 23 Years**

| No. | | | |
|---|---|---|---|
| 10. | **Credits Assigned to this Qualification, Subject to Assessment** *(as per National Credit Framework (NCrF))* | 22 Credits (Only Mandatory Modules/NOS)<br>23 Credits (Including Optional Module/NOS) | **11. Common Cost Norm Category (I/II/III)** *(wherever applicable)*: **II** |
| 12. | **Any Licensing Requirements for Undertaking Training on This Qualification** *(wherever applicable)* | NA | |

| No. | | |
|---|---|---|
| 13. | **Training Duration by Modes of Training Delivery** *(Specify **Total Duration** as per selected training delivery modes and as per requirement of the qualification)* | ☒ **Offline Only** ☒ **Online Only** ☐ **Blended** |

| Training Delivery Mode | Theory (Hours) | Practical (Hours) | OJT (Mandatory) Hours | OJT (Recommended) Hours | Total (Hours) |
|---|---|---|---|---|---|
| **Classroom (offline)**<br>i) Mandatory<br>**ii)** Optional | 204<br>20 | 336<br>10 | 120 | - | 660<br>30 |
| **Online**<br>i) Mandatory<br>ii) Optional | 204<br>20 | 336<br>10 | 120 | - | 660<br>30 |

*(Refer Blended Learning Annexure for details)*

| No. | | |
|---|---|---|
| 14. | **Aligned to NCO/ISCO Code/s** *(if no code is available mention the same)* | NCO-2015/252.NIL |

| 15. | **Progression Path After Attaining the Qualification, wherever applicable** *(Please show Professional and Academic progression)* | This entry should refer to one or more of the following: <br> • **Academic Progression:** Access to other qualifications at the same NSQF level –   Solutions Architect, Senior Database Administrator <br> • **Professional Progression:** Access to related qualification(s) at the next NSQF level –   Chief Data Officer |
|---|---|---|
| 16. | **Other Indian languages in which the Qualification & Model Curriculum are being submitted** | Hindi |
| 17. | **Is similar Qualification(s) available on NQR-if yes, justification for this qualification** | ☐ Yes   ☒ No   URLs of similar Qualifications: |
| 18. | **Is the Job Amenable to Persons with Disability** | ☒ Yes   ☐ No <br> **If "Yes", specify applicable type of Disability:**   Visual, Hearing or Speech impairment, Locomotor Disability |
| 19. | **How participation of women will be encouraged?** | The Program is gender neutral although to increase the women participation, organizations are keeping aside few seats to encourage the female candidates |
| 20. | **Are Greening/Environment Sustainability Aspects covered** *(Specify the NOS/Module which Covers it)* | ☒ Yes   ☐ No, SSC/N9014:  Maintain an inclusive, environmentally sustainable workplace |
| 21. | **Is Qualification suitable to be offered in Schools/Colleges** | Schools: ☐ Yes   ☒ No          Colleges ☒ Yes   ☐ No |
| 22. | **Name and Contact Details Submitting / Awarding Body SPOC** *(In case of CS or MS, provide details of both Lead AB & Supporting ABs)* | **Name: Namrata Kapoor** <br> **Email: Namrata@nasscom.in** <br> **Contact No.: 0120-4990111** <br> **Website: https://nasscom.in** |
| 23. | **Final Approval Date by NSQC: 20-Sep-2020** | 24.  Validity Duration: 5 Years | 25.  Next Review Date: 20-Sep-2025 |

# Section 2: Module Summary

## NOS/s of Qualifications
*(In exceptional cases these could be described as components)*

## Mandatory NOS/s:

Specify the training duration and assessment criteria at NOS/Module level. For Further details refer curriculum document.

**Th.**-Theory  **Pr.**-Practical  **OJT**-On the Job training  **Man.**-Mandatory Training  **Rec.**-Recommended  **Proj.**- Project

| S.No. | NOS/Module Name | NOS/Module Code & Version *(if applicable)* | Core/ Non-Core | NCrF/NSQF Level | Credits as per NCrF | Training Duration (Hours) | | | | | Assessment Marks | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Th. | Pr. | OJT-Man. | OJT-Rec. | Total | Th. | Pr. | Proj. | Viva | Total | Weightage (%) (if applicable) |
| 1. | Bridge Modules | | Core | | 02 | 20:00 | 40:00 | 00:00 | 00:00 | 60:00 | - | - | - | - | - | - |
| 2. | Design new data architectures as per specifications | SSC/N8109 V2.0 | Core | 7 | 04 | 40:00 | 80:00 | 00:00 | 00:00 | 120:00 | 25 | 75 | - | - | 100 | 25 |
| 3. | Architecture Maintenance | SSC/N8110 V2.0 | Core | 7 | 04 | 40:00 | 80:00 | 00:00 | 00:00 | 120:00 | 30 | 70 | - | - | 100 | 25 |
| 4. | Implement data storage network solutions | SSC/N8111 V2.0 | Core | 7 | 04 | 40:00 | 80:00 | 00:00 | 00:00 | 120:00 | 30 | 70 | - | - | 100 | 25 |
| 5. | Empower the team | SSC/N9009 V3.0 | Non-Core | 8 | 01 | 10:00 | 20:00 | 00:00 | 00:00 | 30:00 | 35 | 65 | - | - | 100 | 8 |
| 6. | Maintain an inclusive, environmentally | SSC/N9014 V1.0 | Non-Core | 5 | 01 | 10:00 | 20:00 | 00:00 | 00:00 | 30:00 | 20 | 80 | - | - | 100 | 5 |

| S.No. | NOS/Module Name | NOS/Module Code & Version *(if applicable)* | Core/ Non-Core | NCrF/NSQF Level | Credits as per NCrF | Training Duration (Hours) | | | | | Assessment Marks | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Th. | Pr. | OJT-Man. | OJT-Rec. | Total | Th. | Pr. | Proj. | Viva | Total | Weightage (%) (if applicable) |
| | sustainable workplace | | | | | | | | | | | | | | | |
| 7. | Employability NOS (60 Hrs) | DGT/VSQ/N0102 V1.0 | Non-Core | 4 | 02 | 24:00 | 36:00 | 00:00 | 00:00 | 60:00 | 20 | 30 | - | - | 50 | 12 |
| 8. | OJT | - | - | - | 04 | 00:00 | 00:00 | 120:00 | 00:00 | 120:00 | - | - | - | - | - | - |
| | Duration (in Hours) / Total Marks | | | | 22 | **204:00** | **336:00** | **120:00** | **00:00** | **660:00** | 160 | 390 | - | - | 550 | 100 |

Elective NOS/s:

| S. No | NOS/Module Name | NOS/Module Code & Version *(if applicable)* | Core/ Non-Core | NCrF/NSQF Level | Credits as per NCrF | Training Duration (Hours) | | | | | Assessment Marks | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Th. | Pr. | OJT-Man. | OJT-Rec. | Total | Th. | Pr. | Proj. | Viva | Total | Weightage (%) *(if applicable)* |
| 1. | | | | | | | | | | | | | | | | |
| 2. | | | | | | | | | | | | | | | | |
| Duration (in Hours) / Total Marks | | | | | | | | | | | | | | | | |

Optional NOS/s:

| S. No | NOS/Module Name | NOS/Module Code & Version *(if applicable)* | Core/ Non- Core | NCrF/NSQF Level | Credits as per NCrF | Training Duration (Hours) | | | | | Assessment Marks | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Th. | Pr. | OJT-Man. | OJT-Rec. | Total | Th. | Pr. | Proj. | Viva | Total | Weightage (%) (if applicable) |
| 1. | Define data governance processes and structures | SSC/N8119 V2.0 | Core | 7 | 01 | 20:00 | 10:00 | 00:00 | 00:00 | 30.00 | 27 | 73 | - | - | 100 | 20 |
| Duration (in Hours) / Total Marks | | | | | | 20:00 | 10:00 | 00:00 | 00:00 | 30:00 | 27 | 73 | - | - | 100 | 20 |
| Total Including Optional NOS | | | | | 23 | 224:00 | 346:00 | 120:00 | 00:00 | 690:00 | 187 | 463 | - | - | 650 | - |

## Assessment - Minimum Qualifying Percentage

**Assessment - Minimum Qualifying Percentage**
**Minimum Pass Percentage – Aggregate at qualification level: 70 %** (Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)

# Section 3: Training Related

| 1. | **Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)* | **Educational Qualification:** Graduate in any discipline, preferably Science/Computer Science/Electronics and Engineering /Information Technology |
|---|---|---|
| | | **Industry Experience:** Minimum 2 years of relevant experience in data analysis, data science, big data, or AI |
| | | **Training Experience:** Minimum 1 year of full-time training experience in data analysis, data science, big data, or AI |
| | | **Certification:** "Trainer" mapped to the Qualification Pack "MEP/Q2601, V2.0" Minimum accepted score is 80% aggregate |

| 2. | **Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)* | **Educational Qualification:** Graduate in any discipline, preferably Science/Computer Science/Electronics and Engineering /Information Technology<br><br>**Industry Experience:** Minimum 2 years of relevant experience in data analysis, data science, big data, or AI<br><br>**Training Experience:** Minimum 1 year of full-time training experience in data analysis, data science, big data, or AI<br><br>**Certification:** " Trainer" mapped to the Qualification Pack "MEP/Q2602, V2.0" Minimum accepted score is 90% aggregate |
|----|----|----|
| 3. | **Tools and Equipment Required for the 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 4: Assessment Related

| 1. | **Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)* | **Educational Qualification:** Graduate in any discipline, preferably Science/Computer Science/Electronics and Engineering /Information Technology<br><br>**Industry Experience:** Minimum 2 years of relevant experience in database administration, data science, or big data<br><br>**Training Experience:** Minimum 1 year of full-time training experience in database administration, data science, or big data<br><br>**Certification:** "Assessor" mapped to the Qualification Pack "MEP/Q2701, V2.0" Minimum accepted score is 80% aggregate |
|----|----|----|
| 2. | **Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines), (wherever applicable)* | **Educational Qualification:** Graduate in any discipline, preferably Science/Computer Science/Electronics and Engineering /Information Technology<br><br>**Industry Experience:** Minimum 2 years of relevant experience in database administration, data science, or big data<br><br>**Training Experience:** Minimum 1 year of full-time training experience in database administration, data science, or big data<br><br>**Certification:** "Assessor" mapped to the Qualification Pack "MEP/Q2702, V2.0" Minimum accepted score is 80% aggregate |

| 3. | **Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)* | **Educational Qualification:** Graduate in any discipline, preferably Science/Computer Science/Electronics and Engineering /Information Technology <br><br> **Industry Experience:** Minimum 2 years of relevant experience in database administration, data science, or big data <br><br> **Training Experience:** Minimum 1 year of full-time training experience in database administration, data science, or big data <br><br> **Certification:** "Assessor" mapped to the Qualification Pack "MEP/Q2702, V2.0" Minimum accepted score is 90% aggregate |
|---|---|---|
| 4. | **Assessment Mode** *(Specify the assessment mode)* | Either Online or in Classroom |
| 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 5: Evidence of the Need for the Qualification

*Provide Annexure/Supporting documents name.*

| 1. | Latest Skill Gap study (not older than 2 years) (Yes/No): Yes |
|---|---|
| 2. | Latest Market Research Reports or any other source (not older than 2 years) (Yes/No): Yes |
| 3. | Government/Industry initiatives/requirement (Yes/No): Industry Initiative |
| 4. | Number of industry validations provided: 15 |
| 5. | Estimated number of people to be trained and employed: NA |
| 6. | Evidence of Concurrence/Consultation with Line/State Departments: Applied <br><br> If "No", why: |

# Section 6: Annexure & Supporting Documents Check List

AI- Data Architect

*Specify Annexure Name / Supporting document file name*

| 1. | **Annexure:** NCrF/NSQF level justification based on NCrF/NSQF descriptors *(Mandatory)* | Evidence of Level |
|---|---|---|
| 2. | **Annexure:** List of tools and equipment relevant for NOS *(Mandatory, except in case of online course)* | Tools and Equipment (lab set-up) |
| 3. | **Annexure:** Detailed Assessment criteria *(Mandatory)* | Performance Criteria Details |
| 4. | **Annexure:** Assessment Strategy *(Mandatory)* | Assessment Strategy |
| 5. | **Annexure:** Blended Learning *(Mandatory, in case selected Mode of delivery is Blended Learning)* | To be Developed by Training Partner |
| 6. | **Annexure:** Multiple Entry Exit Details *(Mandatory, in case qualification has multiple entry-exit)* | NA |
| 7. | **Annexure:** Acronym and Glossary *(Optional)* | Acronym and Glossary |
| 8. | **Supporting Document:** Model Curriculum *(Mandatory-Public View)* | MC_SSCQ8107_AI- Data Architect_V3 |
| 9. | **Supporting Document:** Career Progression *(Mandatory-Public View)* | AI BDA Occupational Map |
| 10. | **Supporting Document:** Occupational Map *(Mandatory)* | AI BDA Occupational Map |
| 11. | **Supporting Document:** Assessment SOP *(Mandatory)* | Market research and gap analysis |
| 12. | **Any Other document you wish to submit:** | |

## Annexure: 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** | **Comprehensive, cognitive, theoretical knowledge and practical skills to develop creative solutions to abstract problems.** | The individual in this role needs to have a comprehensive understanding of the objective of | 7 |

| 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 and Technical Skills/ Expertise/ Professional Knowledge**<br><br>**Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill** | **Undertakes self-study; demonstrates intellectual independence, analytical rigour and good communication.**<br><br>• define storage design considerations with relevant business and technical stakeholders<br>• define security standards in alignment with existing governance standards<br>• design architecture that uses data from various sources<br>• define approaches to load data, i.e. either batch-driven or event-driven<br>• define reliable and scalable data pipelines or integrations<br>• different methodological approaches for business continuity, data replication, data backup architecture and methods, and an overview of storage infrastructure & security<br>• different enterprise IT infrastructure components, server- storage connectivity, virtualization technologies, storage devices<br>• different types of storage system architecture, RAID, storage systems, storage area network and network | the type of data, different data assets and the way they are utilized in the organization.<br><br>The individual should be able to use standard and non- standard processes to design elements of the data architecture such as storage networks, databases, or data integrations.<br><br>The individual should have a strong understanding of different standards and approaches for data storage, security, privacy and monitoring.<br><br>The individual should also be able to clearly define the interactions between different elements of data architecture such as the various enterprise IT infrastructure components, storage devices and systems, virtualization technologies and integrations. They should be capable enough to use tools and scripting languages to design or optimize these systems. | |

AI- Data Architect

| 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 |
|---|---|---|---|
| | • attached storage<br>•  different SQL and NoSQL databases such as MongoDB, Redis<br>• different tools for designing data integrations such as Hive or Kafka<br>• how to query and write scripts to acquire and understand the data | | |
| **Broad Learning Outcomes/Core Skill**<br><br>**Responsibility** | **Exercise management and supervision in the context of work/ study having unpredictable changes; responsible for the work of others.**<br><br>• review the capabilities, strengths, and limitations of various data architectures<br>• evaluate changes in cross-border data governance issues, PII regulations, GDPR, security and monitoring standards<br>• determine the right data format depending on whether the application is batch or real-time driven<br>• evaluate the potential evolution of the data technology stack<br>• monitor data architecture performance and recommend suitable improvements<br>• different types of information that team members might need and the importance of providing this information when required<br>• recognise individual contributions and | The individual in this role is responsible for overseeing any changes in data architecture design based on internal and external factors.<br><br>The individual should be able to review the capabilities and limitations of the existing data architecture and recommend modifications to it based on changes in external factors such as fluctuations in global data standards or internal factors such as required performance.<br><br>The role also requires the individual to also work with a team that manages databases or data integrations and provide the necessary information to assist them with their work. They should also develop mechanisms that can enable the team to perform independently and recognize any individual or team accomplishments. | 7 |

| 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 |
|---|---|---|---|
|  | acknowledge team accomplishments<br>• assist team members in delivery of their work |  |  |

## Annexure: Tools and Equipment (lab set-up)

List of Tools and Equipment
**Batch Size:**

| S. No. | Tool / Equipment Name | Specification | Quantity for specified Batch size |
|---|---|---|---|
| 1 | PC/Laptop with internet | With Wifi (2MBPS Dedicated) | 1 Unit per Trainee |
| 2 | Relevant Software | • Database Management System: Cassandra, MongoDB, Oracle PL/SQL, noSQL, Amazon DynamoDB, Apache Hive, MySQL<br>• Database Reporting Software: Microsoft SQL Server Reporting Services, Oracle SQL Plus, SAP Crystal Reports<br>• Data Management PaaS: AWS, Hortonworks, Cloudera, Microsoft Azure<br>• Cluster Management Software: Kubernetes, Apache Mesos, Docker Swarm, CoreOS<br>• ETL Software: Apache Spark, Databricks, Amazon RedShift, CA Erwin Data Modeler, Oracle Warehouse Builder<br>• Data Pipeline Software: Apache Spark, Databricks, Airflow, RJ<br>• Metrics, Segment, Amazon Data Pipeline, Apache Pig | 1 Unit per Trainee |

Classroom Aids
The aids required to conduct sessions in the classroom are:

1. White Board

AI- Data Architect

2. White Board Marker
3. Projector

## Annexure: Industry Validations Summary

Provide summary information of all the industry validations in the table. This is not required for OEM Qualifications.

| S. No | Organization Name | Representative Name | Designation | Contact Address | Contact Phone No | E-mail ID | LinkedIn Profile (if available) |
|---|---|---|---|---|---|---|---|
| 1 | IBM | R Latha | Transformation Leader - Analytics | - | - | rlatha@in.ibm.com | |
| 2 | Ideas Software | Abhijit Joshi | Director, Service Delivery | - | - | abhijit.joshi@ideas.com | |
| 3 | Samsung | Chandra Sekhar | Head ,L&D | - | - | chandra.sekhar@samsung.com | |
| 4 | GE | Ganeshan Rajan | Software Architect | - | - | Ganeshan1.rajan@ge.com | |
| 5 | Intentico | Satish Medapati | Founder & CEO | - | - | satish@intentico.ai | |
| 6 | Mindtree | Shiva Kumar | Head ,L&D | - | - | Shivakumar.GV@mindtree.com | |

## Annexure: Training & Employment Details

**Training & Employment Projections:**

| Year | Total Candidates | | Women | | People with Disability | |
|---|---|---|---|---|---|---|
| | Estimated Training # | Estimated Employed Opportunities | Estimated Training # | Estimated Employed Opportunities | Estimated Training # | Estimated Employed Opportunities |
| | | | | | | |

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

**Training, Assessment, Certification, and Placement Data for previous versions of qualifications:**

| Qualification Version | Year | Total Candidates | | | Women | | | People with disability | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Trained | Assessed | Certified | Trained | Assessed | Certified | Trained | Assessed | Certified |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Applicable for revised qualifications only, data to be provided year-wise for the next 3 years.

**List Schemes in which the previous version of qualification was implemented**:

1.

**Content availability for previous version of qualifications:**

☐ Participant Handbook  ☐ Facilitator Guide  ☐ Digital Content  ☐ Qualification Handbook  ☐ Any Other:

**Language in which content is available:**

# Annexure: Blended Learning

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

*Refer NCVET "Guidelines for Blended Learning for Vocational Education, Training & Skilling" available on:*
*https://ncvet.gov.in/sites/default/files/Guidelines%20for%20Blended%20Learning%20for%20Vocational%20Education,%20Training%20&%20Skilling.pdf*

| 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 | | |
| 2 | ☐Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners | | |
| 3 | ☐Showing Practical Demonstrations to the learners | | |
| 4 | ☐Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training | | |
| 5 | ☐Tutorials/ Assignments/ Drill/ Practice | | |
| 6 | ☐Proctored Monitoring/ Assessment/ Evaluation/ Examinations | | |
| 7 | ☐On the Job Training (OJT)/ Project Work Internship/ Candidate Training | | |

## Annexure: Detailed 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 |
|---|---|---|---|---|---|
| SSC/N8109 Design new data architectures as per specifications | PC1. define the technical and business requirements for the data architecture | 0 | 3 | - | - |
| | PC2. review the capabilities, strengths, and limitations of various data architectures | 0 | 3 | - | - |
| | PC3. formulate strategies and methodologies and identify the best technologies to implement various architectures | 0 | 3 | - | - |
| | PC4.define storage design considerations with relevant business and technical stakeholders | 2 | 5 | - | - |
| | PC5.evaluate changes in cross-border data governance issues, PII (Personally Identifiable Information) regulations, GDPR (General Data Protection Regulations), global-scale, security, and monitoring | 2 | 3 | - | - |
| | PC6. define security standards in alignment with existing governance standards | 2 | 5 | - | - |
| | PC7. analyse common data patterns for transactional systems, time series, and hybrid data solutions | 2 | 3 | - | - |
| | PC8. design architecture that uses data from various sources | 3 | 7 | - | - |
| | PC9.stage the data for processing | 2 | 5 | - | - |
| | PC10. define approaches to load data. i.e., either batch-driven or event-driven | 2 | 5 | - | - |
| | PC11. determine the right data format depending on whether the application is batch or real-time driven | 2 | 5 | - | - |
| | PC12. define data segmentations as per requirements | 2 | 6 | - | - |
| | PC13. define reliable and scalable data pipelines or integrations | 2 | 5 | - | - |
| | PC14. evaluate the potential evolution of the data technology stack | 0 | 5 | - | - |
| | PC15. create documentation on designed data architectures for appropriate people | 0 | 3 | - | - |
| | PC16. validate data architecture with appropriate people | 0 | 3 | - | - |
| | PC17. monitor data architecture performance and recommend suitable improvements | 2 | 3 | - | - |
| | PC18. troubleshoot and resolve issues with new data architectures | 2 | 3 | - | - |
| | **Total Marks** | **25** | **75** | **-** | **-** |
| SSC/N8110 | PC1. Review existing data architectures based on business and technology requirements, performance, and scalability | 5 | 15 | - | - |

| NOS/Module Name | Assessment Criteria for Performance Criteria/Learning Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|---|
| Maintain existing data architectures. | PC2. optimize existing data architectures and recommend efficiencies to data storage and retrieval | 10 | 20 | - | - |
| | PC3. optimize existing data architectures and recommend efficiencies to data processing | 10 | 20 | - | - |
| | PC4. monitor changes in governance standards and update architectures | 5 | 10 | - | - |
| | PC5. update documentation for designed data architectures for appropriate people | 0 | 5 | - | - |
| | **Total Marks** | **30** | **70** | **-** | **-** |
| SSC/N8111 Implement data storage network solutions | PC1. evaluate storage design considerations for the data architecture | 3 | 7 | - | - |
| | PC2. describe assessment goals, objectives and methodology of storage networks | 3 | 7 | - | - |
| | PC3. setup the storage network for the desired architecture | 7 | 13 | - | - |
| | PC4. create documentation on storage networks for appropriate people | 0 | 5 | - | - |
| | PC5. validate storage networks with appropriate people | 0 | 5 | - | - |
| | PC6. monitor system storage performance and recommend suitable improvements | 7 | 13 | - | - |
| | PC7. perform regular port and throughput exercises | 5 | 10 | - | - |
| | PC8. resolve data storage network issues | 5 | 10 | - | - |
| | **Total Marks** | **30** | **70** | **-** | **-** |
| SSC/N9009 Empower the team | PC1. encourage teams to set goals aligned to the vision and objectives of the organization | 5 | 5 | - | - |
| | PC2. express confidence on the team's ability to accomplish certain tasks | 5 | 5 | - | - |
| | PC3. encourage team members with diverse view points to express their concerns | 5 | 5 | - | - |
| | PC4. recognize individual contributions and acknowledge team accomplishments | 5 | 15 | - | - |
| | PC5. assist team members in delivery of their work | 5 | 10 | - | - |
| | PC6. support team members in taking independent action | 5 | 10 | - | - |
| | PC7. develop mechanisms to incorporate and develop ideas from the team | 5 | 15 | - | - |
| | **Total Marks** | **35** | **65** | **-** | **-** |
| Optional- Data Governance: NOS 1 SSC/N8119 Define data governance processes and structures | PC1. define the sources of all the data points, including real-time data points, and the quality of the incoming data | 2 | 3 | - | - |
| | PC2. identify data assets found internally in the organization, and the external data ecosystem | 2 | 3 | - | - |
| | PC3. define the lifecycle for each data asset present in the organization | 2 | 5 | - | - |
| | PC4. evaluate the quality, completeness and timeliness of stored data and ensure that it meets the current needs | 2 | 4 | - | - |
| | PC5. devise strategies to store and manage data as per regulations of the government and the organization | 2 | 5 | - | - |
| | PC6. monitor changes or issues with cross-border data governance regulations such as GDPR | 2 | 3 | - | - |
| | PC7. engage with various relevant stakeholders regarding the management of data | - | 5 | - | - |
| | PC8. define the strategy for data utilization | 3 | 7 | - | - |
| | PC9. develop and communicate standards for data utilization | 3 | 7 | - | - |

| NOS/Module Name | Assessment Criteria for Performance Criteria/Learning Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|---|
| | PC10. develop mechanisms to communicate best practices and reusability of data assets such as algorithms | 3 | 7 | - | - |
| | PC11. define governance models and processes | 3 | 7 | - | - |
| | PC12. define processes for collecting and documenting metadata, and other data documentation processes | 3 | 7 | - | - |
| | PC13. create documentation on data governance processes and structures for appropriate people | - | 5 | - | - |
| | PC14. validate data governance processes with appropriate people | - | 5 | - | - |
| | **Total Marks** | **27** | **73** | **-** | **-** |
| SSC/N9014: Maintain an inclusive, environmentally sustainable workplace | PC1. optimize usage of electricity/energy, materials, and water in various asks / activities / processes and plan the implementation of energy efficient systems in a phased manner | 5 | 15 | - | - |
| | PC2. segregate recyclable, non-recyclable and hazardous waste generated for disposal or efficient waste management | 5 | 15 | - | - |
| | PC3. understand the diversity policy of the organization and use internal & external communication to colleagues to improve | 5 | 10 | - | - |
| | PC4. comply with PwD inclusive policies for an adaptable and equitable work environment | - | 10 | - | - |
| | PC5. improve through specifically designed recruitment practices, PwD friendly infrastructure, job roles, etc. | - | 20 | - | - |
| | PC6. use and advocate for appropriate verbal/nonverbal communication, schemes, and benefits of PwD. | 5 | 10 | - | - |
| | **Total Marks** | **20** | **80** | **-** | **-** |
| DGT/VSQ/N0102 Employability NOS for 60 Hours | PC1. Introduction to Employability Skills | 1 | 1 | - | - |
| | PC2. Constitutional values – Citizenship | 1 | 1 | - | - |
| | PC3. Becoming a Professional in the 21st Century | 2 | 4 | - | - |
| | PC4. Basic English Skills | 2 | 3 | - | - |
| | PC5. Career Development & Goal Setting | 1 | 2 | - | - |
| | PC6. Communication Skills | 2 | 2 | - | - |
| | PC7. Diversity & Inclusion | 1 | 2 | - | - |
| | PC8. Financial and Legal Literacy | 2 | 3 | - | - |
| | PC9. Essential Digital Skills | 3 | 4 | - | - |
| | PC10. Entrepreneurship | 2 | 3 | - | - |
| | PC11. Customer Service | 1 | 2 | - | - |
| | PC12. Getting Ready for Apprenticeship & Jobs | 2 | 3 | - | - |
| | **Total Marks** | **20** | **30** | **-** | **-** |

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# Annexure: Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the learner on the required competencies of the program.

## Assessment System Overview

A uniform assessment of job candidates as per industry standards facilitates progress of the industry by filtering employable individuals while simultaneously providing candidates with an analysis of personal strengths and weaknesses.

## Assessment Criteria

Criteria for assessment for each Qualification File will be created by the Sector Skill Council (SSC). Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down the proportion of marks for Theory and Skills Practical for each PC.

The assessment for the theory part will be based on a knowledge bank of questions created by the SSC. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.

| Guidelines for Assessment | | | |
|---|---|---|---|
| **Testing Environment** | **Tasks and Functions** | **Productivity** | **Teamwork** |

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| | | | |
|---|---|---|---|
| • Carry out assessments under realistic work pressures that are found in the normal industry workplace (or simulated workplace).<br>• Ensure that the range of materials, equipment and tools that learners use are current and of the type routinely found in the normal industry workplace (or simulated workplace) environments. | • Assess that all tasks and functions are completed in a way, and to a timescale, that is acceptable in the normal industry workplace.<br>• Assign workplace (or simulated workplace) responsibilities that enable learners to meet the requirements of the NOS. | • Productivity levels must be checked to ensure that it reflects those that are found in the work situation being replicated. | • Provide situations that allow learners to interact with the range of personnel and contractors found in the normal industry workplace (or simulated workplace). |

## Assessment Quality Assurance framework

NASSCOM provides two assessment frameworks NAC and NAC-Tech.

## NAC (NASSCOM Assessment of Competence)

NAC follows a test matrix to assess Speaking & Listening, Analytical, Quantitative, Writing, and Keyboard skills of candidates appearing for assessment.

## NAC-Tech

NAC-Tech test matrix includes assessment of Communication, Reading, Analytical, Logical Reasoning, Work Management, Computer Fundamentals, Operating Systems, RDBMS, SDLC, Algorithms & Programming Fundamentals, and System Architecture skills.

## Methods of Validation

To pass a QF, a trainee should score an average of 70% or more. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification File.

**Method of assessment documentation and access**

The assessment agency will upload the result of assessment in the portal. The data will not be accessible for change by the assessment agency after the upload. The assessment data will be validated by SSC assessment team. After upload, only SSC can access this data.

# Annexure: 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 |
| **OJT** | On Job Training |

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 based on their main economic function, product, service or technology. |

# Annexure: Market Research & Gap Analysis

Data Architecture plays a key role in the continuous evolution of emerging data technologies. Well- managed Data Architectures and AI technologies are poised to drive future innovations in IT, which will bring in better opportunities for businesses through technological disruptions. AI  requires  a sound Data Architecture with best practices of Data Storage and Data Governance to support organizational goals. Organizations today require a well-defined and structured Data Architecture that accommodates Big Data, IoT, and AI while complying with all the applicable regulations.

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Increasing availability of data required for AI operations means that there is an improved adoption rate of architectures and databases. All these factors are triggering the size of the data management market. According to Stratistics MRC, the Data Management Market accounted for $68.60 billion in 2016 and is expected to reach $142.67 billion by 2023 growing at a CAGR of 11.0% from 2016 to 2023.

Source: https://www.reuters.com/brandfeatures/venture-capital/article?id=24923

The problem with companies which are trying to migrate to advanced data architecture models is that very often, companies are seeking to transform their existing (often legacy) data architectures. They are restricted by siloed data architecture that lacks scalability and performance to process the volume, variety, and velocity of data. To reorient the existing data architecture toward specialized capabilities (that leverage a broad range of data management, governance, integration, integrity, and analytics and data services), there is a need for Data Architects who have the advanced skills to implement such data architectures. Data architects are therefore expected to intelligently manage data, where the intelligence will be derived from machine learning–based constant monitoring, diagnostics, prediction, and prescription.