



## QUALIFICATION FILE

### Cloud Computing Assistant

- Short Term Training (STT)  Long Term Training (LT)  Apprenticeship
- Upskilling  Dual/Flexi Qualification  For ToT  For ToA

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

NCrF/NSQF Level: 3

#### Submitted By:

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## Section 1: Basic Details

1. <b>Qualification Name</b>	Cloud Computing Assistant													
2. <b>Sector/s</b>	IT-ITeS													
3. <b>Type of Qualification:</b> <input checked="" type="checkbox"/> <b>New</b> <input type="checkbox"/> <b>Revised</b> <input type="checkbox"/> <b>Has Electives/Options</b> <input type="checkbox"/> <b>OEM</b>	NQR Code & version of existing/previous qualification:  NA	Qualification Name of existing/previous version:  NA												
4. a. <b>OEM Name</b> b. <b>Qualification Name</b> (Wherever applicable)	-													
5. <b>National Qualification Register (NQR) Code &amp; Version</b> (Will be issued after NSQC approval)	QG-03-IT-00353-2023-V1-NIELIT	6. <b>NCrF/NSQF Level:</b> 3												
7. <b>Award (Certificate/Diploma/Advance Diploma/ Any Other</b> (Wherever applicable specify multiple entry/exists also & provide details in annexure)	Certificate													
8. <b>Brief Description of the Qualification</b>	The enrolled learner would be able to grasp the complete concept of Cloud Computing from a "hands-on" point of view. The learner will be made aware of the concept of virtualization and as a, "Cloud Computing Assistant "would possess the basic skillset to practically implement the concept of virtualisation with an apt exposure to the Linux operating System. With the inclusion of Google Open Source Services, the usage of Software as a Service fundamentals will also be taught to the enrolled learner.													
9. <b>Eligibility Criteria for Entry for Student/Trainee/Learner/Employee</b>	<p><b>a. Entry Qualification &amp; Relevant Experience:</b></p> <table border="1"> <thead> <tr> <th>S. No.</th> <th>Academic/Skill Qualification (with Specialization - if applicable)</th> <th>Required Experience (with Specialization - if applicable)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Grade 10<sup>th</sup> Pass</td> <td>NA</td> </tr> <tr> <td>2.</td> <td>Grade 8<sup>th</sup> Pass with two year of (NTC/ NAC) after 8th Grade 8 pass and pursuing continuous schooling in regular school with vocational subject</td> <td>NA</td> </tr> <tr> <td>3.</td> <td>8th grade pass</td> <td>2 year relevant experience</td> </tr> </tbody> </table> <p><b>b. Age:</b> No Bar</p>		S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1.	Grade 10 <sup>th</sup> Pass	NA	2.	Grade 8 <sup>th</sup> Pass with two year of (NTC/ NAC) after 8th Grade 8 pass and pursuing continuous schooling in regular school with vocational subject	NA	3.	8th grade pass	2 year relevant experience
S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)												
1.	Grade 10 <sup>th</sup> Pass	NA												
2.	Grade 8 <sup>th</sup> Pass with two year of (NTC/ NAC) after 8th Grade 8 pass and pursuing continuous schooling in regular school with vocational subject	NA												
3.	8th grade pass	2 year relevant experience												

10.	<b>Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))</b>	10 Credits	<b>11. Common Cost Norm Category (I/II/III) (wherever applicable):</b>  Category II (Information and Communication technology)																
12.	<b>Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)</b>	NA																	
13.	<b>Training Duration by Modes of Training Delivery</b> <i>(Specify <b>Total Duration</b> as per selected training delivery modes and as per the requirement of the qualification)</i>	<p><input checked="" type="checkbox"/> Offline <input type="checkbox"/> Online <input type="checkbox"/> Blended</p> <table border="1"> <thead> <tr> <th>Training Delivery Modes</th> <th>Theory (Hours)</th> <th>Practical (Hours)</th> <th>OJT Mandatory (Hours)/ Project</th> <th>ES (Hours)</th> <th>Total (Hours)</th> </tr> </thead> <tbody> <tr> <td>Classroom (offline)</td> <td>120</td> <td>120</td> <td>30</td> <td>30</td> <td>300</td> </tr> </tbody> </table> <p><i>The mode of delivery shall be based on the regional demand and can be offered in any of the above modes mentioned.</i></p>						Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)/ Project	ES (Hours)	Total (Hours)	Classroom (offline)	120	120	30	30	300
Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)/ Project	ES (Hours)	Total (Hours)														
Classroom (offline)	120	120	30	30	300														
14.	<b>Aligned to NCO/ISCO Code/s (if no code is available mention the same)</b>	<b>NCO-2015 Code:</b> 2511.9900 (System Analysts)																	
15.	<b>Progression path after attaining the qualification</b> <i>(Please show Professional and Academic progression)</i>	<p><b>Academic:</b> Horizontal: Level 3 Course in Cloud Computing: None</p> <p><b>Vertical:</b> Level 4 Courses in Cloud Computing: Certified Cloud Computing and Virtualization Expert</p> <p>Level 5 Courses in Cloud Computing: Certified Cloud Computing Engineer, Cloud Administrator</p> <p>Level 6 Courses in Cloud Computing: Certified Cloud Computing and Virtualization Expert, Cloud Administrator, Cloud</p>																	

	<p>Architect, Cloud Consultant,</p> <p>Level 7 Courses in Cloud Computing: Cloud Architect, Cloud Consultant,</p> <p>Level 8 Courses in Cloud Computing: Post Graduate Diploma in Cloud Computing,</p> <p><b>Professional:</b> Cloud Computing Assistant-&gt; Junior Cloud Computing Associate-&gt; Senior Cloud Computing Associate</p>
16.	<b>Other Indian languages in which the Qualification &amp; Model Curriculum are being submitted</b>
17.	<b>Is similar Qualification(s) available on NQR-if yes, justification for this qualification</b>
18.	<p><b>Is the Job Role Amenable to Persons with Disability</b></p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><b>If "Yes", specify the applicable type of Disability:</b></p> <p>a. <i>Locomotor Disability</i></p> <ul style="list-style-type: none"> <li>i. <i>Leprosy Cured Person</i></li> <li>ii. <i>Dwarfism</i></li> <li>iii. <i>Muscular Dystrophy</i></li> <li>iv. <i>Acid Attack Victims</i></li> </ul> <p>b. <i>Visual Impairment</i></p> <ul style="list-style-type: none"> <li>i. <i>Low Vision</i></li> </ul>
19.	<b>How Participation of Women will be Encouraged</b>
20.	<b>Are Greening/ Environment Sustainability Aspects Covered (Specify the NOS/Module which covers it)</b>
21.	<b>Is Qualification Suitable to be Offered in</b>

<b>Schools/Colleges</b>	
<b>22.</b> <b>Name and Contact Details of Submitting / Awarding Body SPOC</b> <i>(In case of CS or MS, provide details of both Lead AB &amp; Supporting ABs)</i>	<b>Name:</b> Raminder Singh <b>Email:</b> raminder@nielit.gov.in <b>Contact No.:</b> 01881-257008 <b>Website:</b> <a href="https://nielit.gov.in/chandigarh/index.php">https://nielit.gov.in/chandigarh/index.php</a>
<b>23.</b> <b>Final Approval Date by NSQC: 29/03/2023</b>	<b>24. Validity Duration:</b> 3 years <b>25. Next Review Date :</b> 29/03/2026

## Section 2: Module Summary

### NOS/s of Qualifications

1. Conceptualize Operating Systems (Windows and Linux)
2. Introduction to Network Management
3. Implementing Virtualization and Basics of Cloud Computing.
4. Employability Skills
5. OJT/Project

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

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/ Non-Core	NCrF/ NSQF Level	Credit s as per NCrF	Training Duration (Hours)			Assessment Marks			
						Th.	Pr.	Total	Th.	Pr.	Total	Weightage (%) (if applicable)
1	NOS 1: Conceptualize Operating Systems (Windows and Linux)	NIE/ITS/N1210	Core	3	2	20	40	60	50	22.5	72.5	20.71
2	NOS 2: Introduction to Network Management	NIE/ITS/N1211	Core	3	2	40	20	60	50	22.5	72.5	20.71
3	NOS 3: Implementing Virtualization and Basics of Cloud Computing	NIE/ITS/N1212	Core	3	4	60	60	120	100	45	145	41.42
<b>Sub-total</b>						120	120	240	200	90	290	82.84
4	NOS4: Employability Skills	DGT/VSQ/N0101	Non-Core	3	1	-	-	30	-	-	30	8.6
5	NOS5: OJT / Project	NA	Core	3	1	-	-	30	-	-	30	8.6
<b>Duration (in Hours) /Total Marks</b>						15	120	120	300	200	90	350
<b>100</b>												

## Assessment - Minimum Qualifying Percentage

**Minimum Pass Percentage – Aggregate at qualification level: 50 % (Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)**

Assessment Components	NOS Included	Duration* (in mins)	Marks
Theory Paper-1: Cloud Computing Assistant	NOS 1, NOS 2	90	100
Theory Paper-2: Cloud Computing Assistant	NOS 3	90	100
Practical Paper-1: Cloud Computing Assistant	NOS 1, NOS 2, NOS 3	180	90
Internal Assessment	NOS 4	-	30
Project	NOS 5	-	30
<b>Grand Total</b>			<b>350</b>

\*Assessment strategy shall be as per NIELIT Norms prevailing at times.

## Section 3: Training Related

1.	<b>Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)</b>	O-Level (IT) / BCA / B.Sc (IT/CS) / Diploma in CS/IT/ allied area with 1 year of Experience in training or higher.
2.	<b>Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)</b>	B-LEVEL / MCA/ B.Tech in CS/IT/EC/EE/ allied areas with an experience of 2 years in training
3.	<b>Tools and Equipment Required for Training</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If "Yes", details to be provided in Annexure)
4.	<b>In Case of Revised Qualification, Details of Any Upskilling Required for Trainer</b>	NA

## Section 4: Assessment Related

1.	<b>Assessor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)</b>	B-LEVEL / MCA/ B.Tech in CS/IT/EC/EE/ allied areas with an experience of 2 years in training
2.	<b>Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)</b>	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.	<b>Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)</b>	An External Examiner/ Observer (Subject matter expert) are deployed including NIELIT scientific officers who are subject expert for evaluation of Practical examination/ internal assessment / Project/ Presentation/ assignment and Major Project (if applicable). Qualification is generally B.Tech in CS/IT/EC/EE/ allied areas, MCA, B-Level 'IT'.
4.	<b>Assessment Mode (Specify the assessment mode)</b>	Online for Theory  Online/Offline/Blended for Practical
5.	<b>Tools and Equipment Required for Assessment</b>	<input checked="" type="checkbox"/> Same as for training <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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.	<b>Latest Skill Gap Study (not older than 2 years) (Yes/No):</b> Yes Available in Annexure-B : Evidence of Need
2.	<b>Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):</b> Yes Available in Annexure-B : Evidence of Need
3.	<b>Government /Industry initiatives/ requirement (Yes/No):</b> Yes Available in Annexure-B : Evidence of Need
4.	<b>Number of Industry validation provided:</b> 5
5.	<b>Estimated nos. of persons to be trained and employed:</b> 1000 candidates will be trained in a year.
6.	<b>Evidence of Concurrence/Consultation with Line Ministry/State Departments:</b>

	NIELIT is recognized as AB and AA under Government Category. NIELIT is an HRD arm of MeitY, therefore, the Line Ministry Concurrence is not required.
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### Section 6: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	<b>Annexure:</b> NCrF/NSQF level justification based on NCrF level/NSQF descriptors ( <i>Mandatory</i> )	Available at Annexure-I: Evidence of Level
2.	<b>Annexure:</b> List of tools and equipment relevant for qualification ( <i>Mandatory, except in case of online course</i> )	Available at Annexure-II: Tools and Equipment
3.	<b>Annexure:</b> Detailed Assessment Criteria ( <i>Mandatory</i> )	Available at Annexure-VI: Detailed Assessment Criteria
4.	<b>Annexure:</b> Assessment Strategy ( <i>Mandatory</i> )	Available at Annexure-VII: Detailed Assessment Strategy
5.	<b>Annexure:</b> Blended Learning ( <i>Mandatory, in case selected Mode of delivery is "Blended Learning"</i> )	Available at Annexure-V: Blended Learning
6.	<b>Annexure:</b> Multiple Entry-Exit Details ( <i>Mandatory, in case qualification has multiple Entry-Exit</i> )	NA
7.	<b>Annexure:</b> Acronym and Glossary ( <i>Optional</i> )	Available at Annexure-X: Acronym and Glossary
8.	<b>Supporting Document:</b> Model Curriculum ( <i>Mandatory – Public view</i> )	Available at Annexure-A: Model Curriculum
9.	<b>Supporting Document:</b> Career Progression ( <i>Mandatory - Public view</i> )	Available at Annexure-VIII: Career Progression
10.	<b>Supporting Document:</b> Occupational Map ( <i>Mandatory</i> )	Available at Annexure-IX: Occupational Map
11.	<b>Supporting Document:</b> Assessment SOP ( <i>Mandatory</i> )	Available at Annexure-C: Examination SoP
12.	<b>Any other document you wish to submit:</b>	NA

#### 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
<b>Professional Theoretical Knowledge/Process</b>	<p>1. Gaining Knowledge of how to install and operate Linux and Windows.</p> <p>2. Classification Of Transmission Media and will have in depth idea about various networking devices like Repeaters, Hubs,</p>	<p>1. Possesses specialized operational knowledge and understanding of the work.</p>	3

	<p>Bridges, Switches and routers</p> <p>3. Conceptualization of OSI, TCP/IP Model and Function of layers, Knowledge about various types of networks.</p> <p>4. Differentiate and benefit of Open source Virtualization and proprietary Virtualization.</p> <p>5. Conceptualize Cloud Characteristics along with Features of Cloud Computing.</p>	<p>2. Have complete knowledge of the concept of time required for delivery; and Quality for a range of issues</p>	
<b>Professional and Technical Skills/ Expertise/ Professional Knowledge</b>	<p>1. Students will be able to Configure Network Settings and perform user and group management in Windows as well as Linux</p> <p>2. Knowledge about various network administration software Utility and network troubleshooting.</p> <p>3. Knowledge of Hypervisor and Installation of Virtualization Software.</p> <p>4. Creation of Virtual Machines using Open source virtualization tools</p> <p>5. Depth coverage of Cloud Platform ranging from its benefits to its implementation and its scope and its pros and cons.</p>	<p>1. Possesses specialized professional and technical skills; displays clarity of professional knowledge and technical skills in a broad range of activities/ tasks.</p> <p>2. Have knowledge of collecting and interpreting the available information, drawing conclusions &amp; communicating the same</p>	3
<b>Employment Readiness &amp; Entrepreneurship Skills &amp; Mind-set/Professional Skill</b>	<p>1. Introduction to Employability Skills</p> <p>2. Career Development &amp; Goal Setting</p> <p>3. Becoming a Professional in the 21st Century</p> <p>4. Constitutional values - Citizenship</p> <p>5. Basic English Skills</p> <p>6. Communication Skills</p> <p>7. Essential Digital Skills</p> <p>8. Financial and Legal Literacy</p> <p>9. Customer Service</p> <p>10. Entrepreneurship</p> <p>11. Diversity &amp; Inclusion</p> <p>12. Getting Ready for Apprenticeship &amp; Jobs</p>	<p>1. Can explain Entrepreneurial Mindset and describe the importance of it in the context of opportunity curation for future jobs.</p> <p>2. Can comfortably use most of the basic software with proficiency.</p> <p>3. Have the ability to relate to the 5 pillars of Social Emotional Skills and describe the similarities between SES and Emotional Intelligence.</p>	3
<b>Broad Learning Outcomes/Core Skill</b>	<p>1. Able to troubleshoot in case of facing problems in the Operating system and</p>	<p>1. Students are able to use, create, and configure virtualization solutions.</p>	3

	<p>Networking.</p> <p>2. Conceptualize Cloud Computing Concepts and would be able to differentiate Cloud computing vs. Cluster computing vs. Grid computing</p> <p>3. Able to perform operations on Software as a service platforms</p>	<p>2. Have knowledge of the Cloud computing Project Cycle and apply Cloud Computing technology to improve solutions.</p>	
<b>Responsibility</b>	<p>1. Implement Basic of Cloud Computing Solutions.</p> <p>2. Creating Virtual Machine using Virtual Machine Manager</p> <p>3. Realization of Projects in Cloud Computing domains</p>	<p>1. Takes complete responsibility for delivery and quality of own</p>	3

#### Annexure-II: List of Tools and Equipment

**Batch Size: 30**

<b>S. No.</b>	<b>Tool / Equipment Name</b>	<b>Specification</b>	<b>Quantity for specified Batch size</b>
1	Classroom	1 (30 Sq.m)	30
2	Student Chair	30	30
3	Student Table	30	30
4	Desktop computers with accessories	32 GB RAM with Camera, Headphone and Installed with: Linux , Windows, Windows Server 2019, VirtualBox, Hyper-V, Xen Server	30
5	Laser jet printer	1 Nos.	A4

6	Server	Xeron Processor dual core processor with 128 gb ram and 4 TB Hardisk	1
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### Classroom Aids

The aids required to conduct sessions in the classroom are:

1. LCD Projector
2. Pin-up Board
3. WhiteBoard

### Annexure-III: Industry Validations Summary

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID
1	Essential InfoSec Private Limited	Mr.Pawan Srivastava	Director	1st Floor, Plot No 16, Near State Bank of India, Sultanpur, New Delhi-110030	7985534793	<a href="mailto:pawan@essentialinfosec.com">pawan@essentialinfosec.com</a>
2	Fore Solution (P) Ltd	Manu Mehta	Director	Fore Solution (P) Ltd SCO: 365-66, First Floor, Sector 35, Chandigarh, 160022	9814010307	<a href="mailto:manu@foresolution.net">manu@foresolution.net</a>
3	OST Electronics Pvt Ltd.	Amarjit Singh	Manager -Tech Support	Sco 212, Sector 36-D, Sector 36, Chandigarh, 160036	9815936460	<a href="mailto:amarjit.singh@ostindia.com">amarjit.singh@ostindia.com</a>
4	Spectra Computech Pvt. Ltd.	N.P Singh	Manager Marketing	4th Floor, Godrej Eternia Building Plot No. 70, Industrial Area Phase I, Chandigarh, 160002	9876023966	<a href="mailto:npsingh@spectracomputech.com">npsingh@spectracomputech.com</a>
5	Nice Pvt. ITI	Motilal Ohdar	Director	Moti House, Prince Chowk, Simdega, Jharkhand-835223	79924889955	<a href="mailto:vtpnice13@gmail.com">vtpnice13@gmail.com</a>
6	United Computer	Subhasis Choudhory	Chief Executive	Chotonilpur (pirtala), P.O. Sripally, Burdwan-713103	9641820965	<a href="mailto:united-computer97@rediffmail.com">united-computer97@rediffmail.com</a>

## Annexure-IV: Training &amp; Employment Details

**Training and Employment Projections:**

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities
2023	1000	100	200	100	10	2
2024	1000	100	200	100	10	2
2025	1000	100	200	100	10	2

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

## Annexure V: Blended Learning

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

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	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	Online interaction platforms like JitSi Meet, Bharat VC, Google Meet, MS Teams, etc.	60:40
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	NA	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 Remote Proctored Software	Online: 100% Theory  Offline: 100% Practical
7	On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	Simulated Platform	Either 100% online on virtual environment  Or 100% offline in the Industry.

#### Annexure-VI: 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
NOS 1: Conceptualize Operating Systems (Windows and Linux)	<ol style="list-style-type: none"> <li>1. Configure Network Settings and perform user and group management.</li> <li>2. Knowledge of various management service roles and get acquainted with the concept of remote desktop management</li> <li>3. Installation of Windows and Linux Operating System</li> <li>4. Creation of disk partitions and configure Active directory.</li> <li>5. Conceptualization of Group policy, work in PowerShell and run various Windows commands</li> <li>6. Basic Commands in Linux and implement administrator tasks with sudo.</li> <li>7. Acquire skills pertaining to group user management, Piping and Grep and also mounting of disk.</li> </ol>	50	22.5
NOS 2: Introduction to Network Management	<ol style="list-style-type: none"> <li>1. Overview of OSI, TCP/IP Model and Function of layers, learn about various types of networks.</li> <li>2. Knowledge about the Benefits of Network, Components of Computer</li> </ol>	50	22.5

	<p>Networks and also have an insight into various topologies used in networking.</p> <ol style="list-style-type: none"> <li>3. Explain various Transmission modes, Ethernet and the Classification of Transmission Media.</li> <li>4. In depth idea about various networking devices like Repeaters, Hubs, Bridges, Switches and routers</li> <li>5. Introduction to TCP/IP Protocol Model in Depth, Port Numbers, Common TCP&amp; UDP Ports and also some important TCP/IP protocols.</li> <li>6. IP addressing, Classes, IP Addressing Scheme, Subnetting Basics alongwith How to Create Subnets, Subnet Masks, Subnetting Class C Addresses, Subnetting Class B Addresses and VLSM.</li> <li>7. Configure ip addresses in Windows and Linux and also have a proper introduction to RIR, registries and IANA along with attaining knowledge about TCP/IP Troubleshooting utilities, Troubleshooting IP Addressing</li> </ol>		
NOS 3: Implementing Virtualization and Basics of Cloud Computing	<ol style="list-style-type: none"> <li>1. Differentiating between Open source Virtualization and proprietary Virtualization.</li> <li>2. Installation and use Open source virtualization tools - KVM, Hyper-V and Xen</li> <li>3. Creation of Virtual Machine using Virtualization Tools</li> <li>4. Cloud Computing Concepts and would be able to differentiate Cloud computing vs. Cluster computing vs. Grid computing.</li> <li>5. Conceptualize Cloud Characteristics and Working of Cloud Computing along with Features Of Cloud Computing</li> <li>6. Knowledge pertaining to Types of Cloud</li> <li>7. Enlightened about the Benefits of Cloud Computing and Applications of Cloud Computing In industries,</li> <li>8. In-depth coverage of Cloud Platform ranging from its benefits to its implementation and its scope and its pros and cons</li> </ol>	100	45
NOS 4: Employability Skills	<p>Explanation of the following:</p> <ol style="list-style-type: none"> <li>1. Need for employability skills</li> <li>2. Various constitutional and personal values.</li> <li>3. Different environmentally sustainable practices and their importance</li> <li>4. 21st-century skills and their importance</li> <li>5. How to use the basic spoken English language</li> <li>6. Do's and don'ts of effective communication</li> <li>7. Inclusivity and its importance</li> </ol>		30

	<ul style="list-style-type: none"> <li>8. Different types of disabilities and appropriate communication and behavior towards PwD</li> <li>9. Different types of financial products and services</li> <li>10. How to compute income and expenses</li> <li>11. Importance of maintaining safety and security in financial transactions</li> <li>12. Different legal rights and laws</li> <li>13. How to operate digital devices and applications safely and securely</li> <li>14. Ways to identify business opportunities</li> <li>15. Types of customers and their needs</li> <li>16. How to apply for a job and prepare for an interview</li> <li>17. Apprenticeship scheme and the process of registering on apprenticeship portal</li> </ul>	
NOS 5: OJT/Project	<ul style="list-style-type: none"> <li>1. Demonstration of Cloud Computing Project</li> </ul>	30
	<b>Grand Total</b>	<b>350</b>

#### Annexure-VII: Assessment Strategy

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), Practical assessment, internal assessment, Project/Presentation/ Assignment, Major Project. The emphasis is on the practical demonstration of skills & knowledge gained by the candidate through the training. Each OUTCOME is assessed & marked separately. A candidate is required to pass all OUTCOMES individually based on the passing criteria.

#### **About Examination Pattern:**

1. The question papers for the theory and practical 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 through remote proctoring methodology. Theory examination would be conducted online and the paper comprise of MCQ. Conduct of assessment are through trained proctors. Once the test begins, remote proctors have full access to 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.

4. An External Examiner/ Observer may be deployed including NIELIT officials for evaluation of Practical examination/ internal assessment / Project/ Presentation/. Major Project (if applicable) would be evaluated preferably by external/ subject expert including NIELIT officials.
5. Pass percentage would be 50% marks in each component.
6. Candidates may apply for re-examination within the validity of registration (only in the assessment component in which the candidate failed).
7. For re-examination prescribed examination fee is required to be paid by the candidate only for the assessment component in which the candidate wants to reappear.
8. There would be no exemption for any paper/module for candidates having similar qualifications or skills.
9. 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-VIII: Career Progression:

##### **Academic:**

###### ***Horizontal:***

Level 3 Course in Cloud Computing: None

###### ***Vertical:***

Level 4 Courses in Cloud Computing:

Certified Cloud Computing and Virtualization Expert

Level 5 Courses in Cloud Computing:

Certified Cloud Computing Engineer, Cloud Administrator

Level 6 Courses in Cloud Computing:

Certified Cloud Computing and Virtualization Expert, Cloud Administrator, Cloud Architect, Cloud Consultant,

Level 7 Courses in Cloud Computing:

Cloud Architect, Cloud Consultant,

Level 8 Courses in Cloud Computing:

Post Graduate Diploma in Cloud Computing,

**Cloud Computing Professional:**

Cloud Computing Assistant -> Junior Cloud Computing Associate -> Senior Cloud Computing Associate

[Annexure-IX: Occupational Map](#)

<b>Cloud Computing Assistant</b>	<b>Junior Cloud Computing Associate</b>  <b>Junior Cloud Computing Engineer</b>	<b>Senior Cloud Computing Associate</b>  <b>Senior Cloud Computing Engineer</b>	<b>Cloud developer</b>  <b>Cloud Support</b>  <b>Cloud Computing Professional</b>  <b>System Administrator</b>
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## Annexure-X: Acronym and Glossary

## Acronym

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework
NOS	National Occupational Standard(s)
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework
OJT	On the Job Training

## Glossary

Term	Description
<b>National Occupational Standards (NOS)</b>	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.
<b>Qualification</b>	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
<b>Qualification File</b>	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.
<b>Sector</b>	A grouping of professional activities on the basis of their main economic function, product, service or technology.
<b>Long Term Training</b>	Long-term skilling means any vocational training program undertaken for a year and above. <a href="https://ncvet.gov.in/sites/default/files/NCVET.pdf">https://ncvet.gov.in/sites/default/files/NCVET.pdf</a>