Model Curriculum

Cloud Computing Assistant

QP Code: NIE/ITS/Q1201

Version: 1.0

NSQF Level: 3

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Training Parameters

<table>
<tr><td>Sector</td><td>IT- ITeS</td></tr>
<tr><td>Sub-Sector</td><td>Cloud Computing & Virtualization</td></tr>
<tr><td>Occupation</td><td>Cloud support services</td></tr>
<tr><td>Country</td><td>India</td></tr>
<tr><td>NSQF Level</td><td>3</td></tr>
<tr><td>Aligned to NCO/ISCO/ISIC Code</td><td>NCO-2015 Code: 2511.9900 (System Analysts)</td></tr>
<tr><td>Minimum Educational Qualification and Experience</td><td>
<table>
<tr><th>S. No.</th><th>Academic/Skill Qualification (with Specialization - if applicable)</th><th>Required Experience (with Specialization - if applicable)</th></tr>
<tr><td>1.</td><td>Grade 10th Pass</td><td>NA</td></tr>
<tr><td>2.</td><td>Grade 8th 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>
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</td></tr>
<tr><td>Pre-Requisite License or Training</td><td>-</td></tr>
<tr><td>Minimum Job Entry Age</td><td>No Bar</td></tr>
<tr><td>Last Reviewed On</td><td>29/03/2023</td></tr>
<tr><td>Next Review Date</td><td>29/03/2026</td></tr>
<tr><td>NSQC Approval Date</td><td>29/03/2023</td></tr>
<tr><td>QP Version</td><td>1.0</td></tr>
<tr><td>Model Curriculum Creation Date</td><td>29/03/2023</td></tr>
<tr><td>Model Curriculum Valid Up to Date</td><td>29/03/2026</td></tr>
<tr><td>Model Curriculum Version</td><td>1.0</td></tr>
<tr><td>Duration of the Course</td><td>300 Hrs.</td></tr>
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Program Overview

This section summarises the end objectives of the program along with its duration

Training Outcomes of the course:

Students will be able to understand the following concepts

- Students will be able to Understand Basic Windows and its Control Panel
- Students will be able to Configure Network Setting, perform user and group management.
- Students will able to learn about various management service roles and get acquainted with the concept of remote desktop management
- Students will be able to install Windows Operating system and Windows Server Operating System
- Student will have Overview of OSI ,TCP/IP Model and Function of layers, learn about various types of networks
- Students will learn about concept of Virtualisation and would be able to differentiate proprietary Virtualisation
- Students will learn how to Install Virtual Machine Manager

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the Qualification file.

NOS/Module Name	Theory	Practical	Total
NOS 1:Conceptualize Operating Systems (Windows and Linux) NOS Code: NIE/ITS/N1210 NSQF Level-3	20	40	60
NOS 2: Introduction to Network Management NOS Code: NIE/ITS/N1211 NSQF Level-3	40	20	60
NOS 3: Implementing Virtualization and Basics of Cloud Computing NOS Code: NIE/ITS/N1212 NSQF Level-3	60	60	120
NOS 4: Employability Skills NOS Code: DGT/VSQ/N0101 NSQF Level-3	-	-	30
NOS 5: OJT/Project NOS Code: NA NSQF Level-3	-	-	30
Total	**120**	**120**	**300**

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Module Details

Module 1/ (NOS1): Conceptualize Operating Systems (Windows and Linux)

NOS Code: NIE/ITS/N1210

Terminal Outcomes:

After completion of the module, the students shall be able to understand:

- Students will be able to Understand Basic Windows and its Control Panel Students will be able to Configure Network Setting, perform user and group management.
- Students will able to learn about various management service roles and get acquainted with the concept of remote desktop management
- Students will be able to install Windows Operating system and Windows Server Operating System
- Students will create disk partitions and configure Active directory. Students will understand the concepts of Group policy , work in Power Shell and run various Windows commands

Key Learning Outcomes:

Duration: 20 hours	**Duration: 40 hours**
Theory	**Practical**
Understand the history, evolution, and architecture of the Windows operating system.	Identify and navigate key components of the Windows operating system, including the desktop, taskbar, and file explorer.
Understand the prerequisites for installing the Windows operating system on different hardware platforms.	Configure installation settings, including disk partitioning, user accounts, and network configurations.
Learn about the core components of the Windows operating system, such as the registry, services, and file systems.	Install and uninstall software applications and manage system updates. Use Windows utilities for disk cleanup, defragmentation, and system backups.
Learn about different Linux distributions, their features, and selection criteria for various applications.	Navigate through the Linux operating system, including the command-line interface (CLI) and graphical user interface (GUI).
Classroom Aid	
LCD Projector, White Board, Laptop, Internet with WiFi	
Tools, Equipment and Other Requirements	
NumPy, Pandas, Matplotlib, Seaborn, Scikit-Learn, tensorflow, Keras, PyTorch	

NOS 2: Introduction to Network Management.

NOS Code: NIE/ITS/N1211

Terminal Outcomes:

After completion of the module, the students shall be able to:

- Student will have Overview of OSI ,TCP/IP Model and Function of layers, learn about various types of networks
- Students will come to know about Benefits of Network, Components of Computer Network and also have an insight into various topologies used in networking
- Students will be able to explain various Transmission modes, Ethernet, Classification Of Transmission Media and will have in depth idea about various networking devices like Repeaters, Hubs, Bridges, Switches and routers
- Students will be learning about TCP/IP Protocol Model in Depth, Port Numbers, Common TCP& UDP Ports and also Some important TCP/IP protocols

Key Learning Outcomes:

Duration: 40 hours	**Duration: 20 hours**
Theory	**Practical**
Able to explain the basic concepts of networking, including definitions of networks, types of networks (LAN, WAN, MAN), and their characteristics.	Able to set up a basic local area network (LAN) using physical devices such as switches and routers, demonstrating an understanding of how different components interact within a network.
Learn the operational principles of these devices and how they contribute to data transmission within a network.	Identify and describe the functions of various networking devices, including hubs, switches, routers, bridges, and access points.
Gain a comprehensive understanding of the TCP/IP architecture, including its layers (Application, Transport, Internet, and Network Access) and their functions.	Implement the TCP/IP model in practical scenarios by configuring devices to communicate over the Internet Protocol suite.
Gain knowledge about subnetting concepts and how they are used to divide larger networks into smaller segments for efficient management.	Learn to manually configure static IP addresses on devices within a network and understand the implications of dynamic IP addressing through DHCP.
Classroom Aid	
LCD Projector, White Board, Laptop, Internet with WiFi	
Tools, Equipment and Other Requirements	
NumPy, Pandas, Matplotlib, Seaborn, Scikit-Learn, tensorflow, Keras, PyTorch	

NOS 3: Implementing Virtualization and Basics of Cloud Computing

NOS Code: NIE/ITS/N1212

Terminal Outcomes:

After completion of the module, the students shall be able to:

- Students will learn about Open source Virtualisation and proprietary Virtualisation
- Students will learn how to Install Virtual Machine Manager
- Student will be able install and use Open source virtualization tools - KVM, Hyper-V and Xen
- Students will understand also learn Installation of Virtual Machine using Virtualisation Tools
- Students will learn Cloud Computing Concepts and would be able to differentiate Cloud computing vs. Cluster computing vs. Grid computing.

Key Learning Outcomes:

Duration: 60 hours	**Duration: 60 hours**
Theory	**Practical**
Able to define virtualization and explain its significance in modern computing environments, including the benefits of resource optimization and cost reduction.	Able to create and configure virtual machines (VMs) using virtualization software (e.g., VMware Workstation, Oracle VirtualBox), understanding the underlying architecture of virtualization.
Understand best practices for implementing virtualization solutions in organizational settings, including considerations for hardware compatibility and resource allocation.	Install various virtualization tools (e.g., VMware ESXi, Microsoft Hyper-V) in a lab environment and configure them for optimal performance.
Learn about different cloud service models (IaaS, PaaS, SaaS) and their respective roles in providing IT solutions.	Gain hands-on experience accessing various cloud platforms (e.g., AWS, Azure, and Google Cloud) and navigating their interfaces.
Able to evaluate GCP services based on specific use cases and business requirements.	Create and configure Google Cloud projects, including setting up billing accounts and managing permissions through Identity and Access Management (IAM).
Classroom Aid	
LCD Projector, White Board, Laptop, Internet with WiFi	
Tools, Equipment and Other Requirements	
NumPy, Pandas, Matplotlib, Seaborn, Scikit-Learn, tensorflow, Keras, PyTorch	

Module 4: Employability Skills
NOS Code: DGT/VSQ/N0101

Terminal Outcomes:

After completing this program, participants will be able to:

- Outline the importance of Employability Skills for the current job market and future of work.

- List different learning and employability-related GOI and private portals and their usage.
- Research and prepare a note on different industries, trends, required skills, and the available opportunities.

Key Learning Outcomes

Duration: 30 Hrs.
Key Learning Outcomes
Constitutional Values – Citizenship • Explain constitutional values, including civic rights and duties, citizenship, responsibility towards society, and personal values and ethics such as honesty, integrity, caring, and respecting others that are required to become a responsible citizen. • Demonstrate how to practice different environmentally sustainable practices. **Becoming a Professional in the 21st Century** • Discuss relevant 21st-century skills required for employment. • Highlight the importance of practicing 21st-century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn, etc., in personal or professional life. • Create a pathway for adopting a continuous learning mindset for personal and professional development. **Basic English Skills** • Show how to use Basic English sentences for everyday conversation in different contexts, in person and over the telephone. • Read and understand text written in Basic English. • Write a short note/paragraph/letter/e-mail using correct Basic English. **Career Development & Goal Setting** • Create a career development plan. • Identify well-defined short- and long-term goals. **Communication Skills** • Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette. • Write a brief note/paragraph on a familiar topic. • Explain the importance of communication etiquette, including active listening for effective communication. • Role-play a situation on how to work collaboratively with others in a team. **Diversity and Inclusion** • Demonstrate how to behave, communicate, and conduct appropriately with all genders and PwD. • Discuss the significance of escalating sexual harassment issues as per the POSH act.

Financial and Legal Literacy

- Discuss various financial institutions, products, and services.
- Demonstrate how to conduct offline and online financial transactions safely and securely and check passbook/statement.
- Explain the common components of salary such as Basic, PF, Allowances (HRA, TA, DA, etc.), and tax deductions.
- Calculate income and expenditure for budgeting.
- Discuss legal rights, laws, and aids.

Essential Digital Skills

- Describe the role of digital technology in day-to-day life and the workplace.
- Demonstrate how to operate digital devices and use the associated applications and features safely and securely.
- Demonstrate how to connect devices securely to the internet using different means.
- Follow the dos and don'ts of cybersecurity to protect against cybercrimes.
- Discuss the significance of displaying responsible online behavior while using various social media platforms.
- Create an email id and follow email etiquette to exchange emails.
- Show how to create documents, spreadsheets, and presentations using appropriate applications.
- Utilize virtual collaboration tools to work effectively.

Entrepreneurship

- Explain the types of entrepreneurship and enterprises.
- Discuss how to identify opportunities for potential business, sources of funding, and associated financial and legal risks with its mitigation plan.
- Describe the 4Ps of Marketing-Product, Price, Place, and Promotion and apply them as per requirement.
- Create a sample business plan for the selected business opportunity.

Customer Service

- Classify different types of customers.
- Demonstrate how to identify customer needs and respond to them in a professional manner.
- Discuss various tools used to collect customer feedback.
- Discuss the significance of maintaining hygiene and dressing appropriately.

Getting ready for Apprenticeship & Jobs

- Draft a professional Curriculum Vitae (CV).
- Use various offline and online job search sources to find and apply for jobs.
- Discuss the significance of maintaining hygiene and dressing appropriately for an interview.
- Role-play a mock interview.
- List the steps for searching and registering for apprenticeship opportunities.

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	**Specialization**	**Years**	**Specialization**	
O-Level (IT) / BCA / B.Sc(IT/CS) / Diploma in CS/IT/ allied area	IT/Computer Science/EC/EE allied branches	2	-	-	-	-

Trainer Certification	
Domain Certification	**Platform Certification**
Certified to TOT for the job role: **NIE/ITS/Q1201** "Cloud Computing Assistant" or equivalent as per NCrF. Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: "Trainer (VET and skills)", mapped to the Qualification Pack: "MEP/Q2601, v2.0" or equivalent as per NCrF. Minimum accepted score is 80%

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
B-LEVEL / MCA/ B.Tech in CS/IT/EC/EE/ allied areas	IT/Computer Science/EC/EE allied branches	4	-	-	-	-

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Assessor Certification	
Domain Certification	**Platform Certification**
Certified to TOA for the job role: **NIE/ITS/Q1201** "Cloud Computing Assistant" or equivalent as per NCrF. Minimum accepted score is 80%	Recommended that the assessor is certified for the Job Role: "Trainer (VET and skills)", mapped to the Qualification Pack: "MEP/Q2701, v2.0" or equivalent as per NCrF. Minimum accepted score is 80%

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), 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 exams are set by the Examination wing (assessor) of NIELIT HQS.

2. The assessor assigns the 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

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards