Government of Pakistan

National Vocational and Technical Training Commission

Prime Minister's Youth Skills Development Programme

Course Contents/ Lesson Plan

Course Title: System Administration and Infrastructure Service

Duration:3 Months

Revised Edition

Trainer Name	
Course Developer Name	
Course Title	System Administration and Infrastructure Service
Objectives and Expectations	**Employable skills and hands on practice for Graphic Designing and video editing** This six months' program you equip with Linux/Windows administration "survival skills" by focusing on foundational Linux/Windows concepts and core tasks. You will learn how to apply command-line concepts and enterprise-level tools, starting you on your journey toward becoming a full-time System Administrator Students in this six months program have the opportunity to learn the technical • Use administrative techniques and tools in Windows Server 2019. • Implement identity Services. • Manage network infrastructure services. • Configure file servers and storage. • Manage virtual machines using Hyper-V virtualization and containers • Implement high availability and disaster recovery solutions. • Apply security features to protect critical resources. • Configure Remote Desktop Services. • Configure a virtual machine-based desktop infrastructure deployment. • Implement remote access and web services. • Implement service monitoring and performance monitoring, and apply troubleshooting. • Perform upgrades and migration related to AD DS, and storage. LINUX • Understand and use essential tools for handling files, directories, command-line environments, and documentation • Create simple shell scripts • Operate running systems, including booting into different run levels, identifying processes, starting and stopping virtual machines, and controlling services • Configure local storage using partitions and logical volumes • Create and configure file systems and file system attributes, such as permissions, encryption, access control lists, and network file systems • Deploy, configure, and maintain systems, including software installation, update, and core services • Manage users and groups • Manage security, including basic firewall and SELinux configuration

- Perform basic container management

Main Expectations:

In short, the course under reference should be delivered by professional instructors in such robust hands- on manner that the trainees are comfortably able to employ their skills for earning money (through wage/self-employment) at its conclusion.

This course thus clearly goes beyond the domain of the traditional training practices in vogue and underscores an expectation that a market centric approach will be adopted as the main driving force while delivering it. The instructors should therefore be experienced enough to be able to identify the training needs for the possible market roles available out there. Moreover, they should also know the strengths and weaknesses of each individual trainee to prepare them for such market roles during/after the training.

- Specially designed practical tasks to be performed by the trainees have been included in the Annexure-I to this document. The record of all tasks performed individually or in groups must be preserved by the management of the training Institute clearly labeling name, trade, session etc so that these are ready to be physically inspected/verified through monitoring visits from time to time. The weekly distribution of tasks has also been indicated in the weekly lesson plan given in this document.
- In order to materialize the main expectations, a special module on Job Search & Entrepreneurial Skills has been included in the later part of this course (5th & 6th month) through which, the trainees will be made aware of the Job search techniques in the local as well as international job markets (Gulf countries). Awareness around the visa process and immigration laws of the most favoured labour destination countries also forms a part of this module. Moreover, the trainees would also be encouraged to venture into self-employment and exposed to the main requirements in this regard. It is also expected that a sense of civic duties/roles and responsibilities will also be inculcated in the trainees to make them responsible citizens of the country.
- A module on Work Place Ethics has also been included to highlight the importance of good and positive behavior at work place in the line with the best practices elsewhere in the world. An outline of such qualities has been given in the Appendix to this document. Its importance should be conveyed in a format that is attractive and interesting for the trainees such as through PPT slides +short video documentaries. Needless to say that if the training provider puts his heart and soul into these otherwise non-technical components, the image of Pakistani workforce would undergo a positive transformation in the local as well as international job markets.

In order to maintain interest and motivation of the trainees throughout the course, modern techniques such as:

- Motivational Lectures
- Success Stories
- Case Studies

These techniques would be employed as an additional training tool

wherever possible (these are explained in the subsequent section on Training Methodology).

Lastly, evaluation of the competencies acquired by the trainees will be done objectively at various stages of the training and proper record of the same willbe maintained. Suffice to say that for such evaluations, practical tasks would be designed by the training providers to gauge the problem solving abilities of the trainees.

- **Motivational Lectures**

The proposed methodology for the training under reference employs motivation as a tool. Hence besides the purely technical content, a trainer is required to include elements of motivation in his/her lecture. To inspire the trainees to utilize the training opportunity to the full and strive towards professional excellence. Motivational lectures may also include general topics such as the importance of moral values and civic role & responsibilities as a Pakistani. A motivational lecture should be delivered with enough zeal to produce a deep impact on the trainees. It may comprise of the following:

- Clear Purpose to convey message to trainees effectively.
- Personal Story to quote as an example to follow.
- Trainees Fit so that the situation is actionable by trainees and notrepresent a just idealism.
- Ending Points to persuade the trainees on changing themselves.

A good motivational lecture should help drive creativity, curiosity and spark the desire needed for trainees to want to learn more.

Impact of a successful motivational strategy is amongst others commonly visible in increased class participation ratios. It increases the trainees' willingness to be engaged on the practical tasks for longer time without boredom and loss of interest because they can clearly see in their mind's eye where their hard work would take them in short (1-3 years); medium (3 -10 years) and long term (more than 10 years).

As this tool is expected that the training providers would make arrangementsfor regular well planned motivational lectures as part of a coordinated strategy interspersed throughout the training period as suggested in the weekly lesson plans in this document.

Course related motivational lecture online link is available in **annexure II**.

- Through an audio/ videotaped message (2-3 high quality videos must be arranged by the training institute)

It is expected that the training provider would collect relevant high quality success stories for inclusion in the training as suggested in the weekly lesson plan given in this document.

Suggestive structure and sequence of a sample success story and its various shapes can be seen at **annexure III**.

- **Case Studies**

Where a situation allows, case studies can also be presented to the trainees to widen

	their understanding of the real life specific problem/situation and to explore the solutions. In simple terms, the case study method of teaching uses a real life case example/a typical case to demonstrate a phenomenon in action and explain theoretical as well as practical aspects of the knowledge related to the same. Itis an effective way to help the trainees comprehend in depth both the theoretical and practical aspects of the complex phenomenon in depth with ease. Case teaching can also stimulate the trainees to participate indiscussions and thereby boost their confidence. It also makes class room atmosphere interesting thus maintaining the trainee interest in training till the end of the course. Depending on suitability to the trade, the weekly lesson plan in this document may suggest case studies to be presented to the trainees. The trainer mayadopt a power point presentation or video format for such case studies whichever is deemed suitable but it's important that only those cases are selected that are relevant and of a learning value. The Trainees should be required and supervised to carefully analyze the cases. For the purpose they must be encouraged to inquire and collect specific information / data, actively participate in the discussions and intended solutions of the problem / situation. Case studies can be implemented in the following ways: - • A good quality trade specific documentary (At least 2-3 documentaries must be arranged by the training institute) • Health &Safety case studies (2 cases regarding safety and industrial accidents must be arranged by the training institute) Field visits(At least one visit to a trade specific major industry/ site must be arranged by the training institute)
Entry-level of trainees	**Intermediate**
Teacher's Eligibility Criteria	**Qualifications**: • Bachelor's degree in IT or related field (Master's preferred). • Relevant certifications (e.g., Windows Server Administrator, RHCE, LPIC). **Technical Expertise**: • Proficiency in Windows Server (identity services, network infrastructure, Hyper-V, security). • Hands-on Linux server management and advanced storage systems. **Experience**: • 3+ years in system administration. • 1+ year in teaching or training IT courses. **Skills**: • Strong communication and teaching ability. • Knowledge of freelancing, portfolio building, and industry trends.

Learning Outcomes of the course	By the end of this course, students will be able to: • To learn how to install and configure a Server based operating system • To learn how to manage users and groups, as well as best practices for supporting the users (customers) of an organization's computing infrastructure • To understand how to create and use Unix/Windows file systems o To appreciate the importance of ethics in system administration, and tounderstand and apply a set of ethical • rules in management of a computer system • To become familiar with a basic set of Unix/Windows operating commands and utilities • To understand the importance of communication and documentation, and use software tools to keep active • documentation of system changes and to track and manage customer requests • To understand the importance of automation, and be able to create scripts and use other tools to automate system management procedures • To know some basic security measures to take in system administration • To prepare for possible disasters, including an understanding of backup and restoration of file systems • To know how to manage system resources, including methods for tracking system metrics • To apply these skills in the administration of an actual computer system with actual users (customers)
Course Execution Plan	The total duration of the course:**3 months (12 Weeks)** Class hours:**4 hours per day** Theory:**20%** Practical: **80%** Weekly hours: **20 hours per week** Total contact hours: **260 hours**
Companies offering jobs in the respective trade	1. Software Houses 2. IT Universities 3. News Offices 4. Telecom Companies 5. Banking Companies 6. Game Design Studios 7. Freelancing Websites 8. Book/magazine publishers 9. Interior/furniture design houses 10. Textile Companies
Job Opportunities	3D Animation, VR & SIMULATION, also known as Communication and Visual design is recognized across the world as the leader in visual content design. Graphic designers thus hold a high rate of employability in various capacities across various industries. As long as social media, visual and communication space, digital design and interaction landscape is alive and functioning, Graphic Designers will always have a pivotal role in how the digital and communication world appears to everyone. Following are some of the roles that are present and or may become available as trends shift

	and morph to the Graphic Designer: Animator Web designer Mobile app designerVideo editor Illustrator Graphic Designer Game asset creatorLogo creator Social media and marketing specialist
No of Students	25
Learning Place	Classroom / Lab

MODULES

Scheduled Weeks	Module Title	Days	Hours	Learning Units	Home Assignment
Week 1	**Introduction to Windows Server Administration Overview**	**Day1**	**Hour 1**	Course Introduction and Expectations	
			Hour 2	Motivational lectures	
			Hour 3	Job Market Overview	
			Hour 4	Work Ethics in IT	
		Day 2	**Hour 1**	Overview of Windows Server Administration Principles.	
			Hour 2	Introducing Windows Server 2019.	
			Hour 3	Windows Server Core Overview.	• **Task 1**
			Hour 4	Tools: Windows Admin Center, PowerShell.	*Details may be seen at Annexure-I*
		Day 3	**Hour 1**	Deployment Techniques.	
			Hour 2	Activation Methods.	
			Hour 3	Server Role Overview.	
			Hour 4	Overview of Security Features.	
		Day 4	**Hour 1**	Use Cases of Windows Server in Industry.	
			Hour 2	Understanding Licensing.	

			Hour 3	Key Differences Between Editions.	
			Hour 4	Deployment Planning.	
		Day 5	**Hour 1**	Task Review.	
			Hour 2	Practical Exercises.	
			Hour 3	Q&A Session.	
			Hour 4	Assessment: Task 1, 2, 3.	
Week 2	**Identity Services in Windows Server**	**Day1**	**Hour 1**	Overview of AD DS.	
			Hour 2	Deploying Domain Controllers.	
			Hour 3	Benefits of Azure AD Integration.	
			Hour 4	Configuring Azure AD Sync.	
		Day 2	**Hour 1**	Introduction to Group Policy.	• **Task 2** *Details may be seen at Annexure-I*
			Hour 2	Creating and Editing GPOs.	
			Hour 3	Linking GPOs to OUs.	
			Hour 4	Overview of Group Policy Preferences.	
		Day 3	**Hour 1**	Understanding Certificate Services.	
			Hour 2	Deploying Certificate Services.	

			Hour 3	Configuring Certificate Templates.	
			Hour 4	Benefits of PKI in Windows Server.	
		Day 4	**Hour 1**	Practical Task: Configuring Domain Controllers.	
			Hour 2	Troubleshooting GPOs.	
			Hour 3	Certificate Authority Configuration.	
			Hour 4	Security Best Practices.	
		Day 5	**Hour 1**	Task Review.	
			Hour 2	Q&A Session.	
			Hour 3	Practical Assessment.	
			Hour 4	Assessment: Task 4, 5, 6.	
Week 3	**Network Infrastructure Services in Windows Server**	**Day1**	**Hour 1**	DHCP Overview.	
			Hour 2	Configuring DHCP Scopes.	• **Task 3** *Details may be seen at Annexure-I*
			Hour 3	DNS Basics.	
			Hour 4	Creating and Managing DNS Zones.	
		Day 2	**Hour 1**	Introduction to IPAM.	

			Hour 2	Configuring IPAM.	
			Hour 3	Monitoring IP Usage.	
			Hour 4	Remote Access Services Overview.	
		Day 3	**Hour 1**	Configuring Remote Access Services.	
			Hour 2	Understanding VPNs.	
			Hour 3	Configuring VPN Access.	
			Hour 4	Practical Examples: Networking Tools.	
		Day 4	**Hour 1**	DHCP Troubleshooting.	
			Hour 2	DNS Troubleshooting.	
			Hour 3	Managing Network Roles.	
			Hour 4	Advanced IPAM Features.	
		Day 5	**Hour 1**	Task Review.	
			Hour 2	Q&A Session.	
			Hour 3	Hands-on Practical..	
			Hour 4	Assessment: Task 7, 8.	

WEEK 4	**File Servers and Storage Management in Windows Server**	**Day1**	**Hour 1**	Success Stories (For further detail, see Page No: 3 & 4).	
			Hour 2	Volumes and File Systems in Windows Server.	
			Hour 3	Implementing File Sharing.	
			Hour 4	Storage Spaces Overview.	
		Day 2	**Hour 1**	Configuring Storage Spaces.	
			Hour 2	Introduction to Data Deduplication.	
			Hour 3	Implementing iSCSI-Based Storage.	• **Task 4** *Details may be seen at Annexure-I*
			Hour 4	Overview of Distributed File System (DFS).	
		Day 3	**Hour 1**	Configuring DFS Namespaces and Replication.	
			Hour 2	Troubleshooting File Server Issues.	
			Hour 3	Practical Exercise: File Sharing and DFS.	
			Hour 4	Review of Storage Tools.	
		Day 4	**Hour 1**	Advanced File Server Roles.	
			Hour 2	Security Best Practices in Storage Management.	
			Hour 3	Practical Exercise: Data Deduplication.	

			Hour 4	Review and Q&A.	
		Day 5	**Hour 1**	Monthly Test 1.	
			Hour 2	Feedback Session.	
			Hour 3	Task Discussion (Task 9, Task 10, Task 11).	
			Hour 4	Final Assessment.	
Week 5	**Hyper-V Virtualization and Containers in Windows Server**	**Day1**	**Hour 1**	Motivational Lecture (For further detail, see Page No: 3 & 4).	
			Hour 2	Introduction to Hyper-V.	
			Hour 3	Configuring Virtual Machines.	
			Hour 4	Overview of Shielded VMs.	
		Day 2	**Hour 1**	Securing Virtualized Environments.	• **Task 5** *Details may be seen at Annexure-I*
			Hour 2	Host Guardian Service (HGS) Overview.	
			Hour 3	Introduction to Containers in Windows Server.	
			Hour 4	Installing and Configuring Containers.	
		Day 3	**Hour 1**	Overview of Kubernetes in Windows Server.	
			Hour 2	Practical Exercise: Managing Hyper-V VMs.	

			Hour 3	Troubleshooting Virtualization Issues.	
			Hour 4	Security Best Practices for Virtualization.	
		Day 4	**Hour 1**	Advanced Features of Hyper-V.	
			Hour 2	Managing Storage for Virtual Machines.	
			Hour 3	Practical Exercise: Deploying Containers.	
			Hour 4	Review and Q&A.	
		Day 5	**Hour 1**	Task Discussion (Task 12, Task 13).	
			Hour 2	Assessment: Hyper-V Setup.	
			Hour 3	Practical Task: Virtualization.	
			Hour 4	Feedback Session.	
Week 6	**High Availability and Disaster Recovery in Windows Server**	**Day1**	**Hour 1**	Success Stories (For further detail, see Page No: 3 & 4).	• **Task 6** *Details may be seen at Annexure-I*
			Hour 2	Introduction to Failover Clustering.	
			Hour 3	Planning Failover Cluster Implementation.	
			Hour 4	Configuring Failover Clusters.	
		Day 2	**Hour 1**	Overview of Stretch Clusters.	

			Hour 2	High Availability with Hyper-V VMs.	
			Hour 3	*Introduction to Hyper-V Replica.*	
			Hour 4	Configuring Hyper-V Replica.	
		Day 3	**Hour 1**	Overview of Azure Site Recovery.	
			Hour 2	Implementing Windows Server Backup.	
			Hour 3	Practical Exercise: Configuring Failover Clusters.	
			Hour 4	Troubleshooting High Availability Solutions.	
		Day 4	**Hour 1**	Disaster Recovery Planning.	
			Hour 2	Testing High Availability Scenarios.	
			Hour 3	Practical Task: Backup and Recovery.	
			Hour 4	Review and Q&A.	
		Day 5	**Hour 1**	*Task Discussion (Task 14, Task 15, Task 16).*	
			Hour 2	Monthly Test 2.	
			Hour 3	Feedback Session.	
			Hour 4	Final Assessment.	

Week 7	**Windows Server Security**	**Day1**	**Hour 1**	Success Stories (For further detail, see Page No: 3 & 4).	
			Hour 2	Introduction to Windows Server Security Features.	
			Hour 3	Credentials and Privileged Access Protection.	
			Hour 4	Configuring Secure Password Policies.	
		Day 2	**Hour 1**	Hardening Windows Server Environments.	
			Hour 2	Implementing Just Enough Administration (JEA).	
			Hour 3	Securing SMB Traffic.	
			Hour 4	Overview of Windows Server Update Management.	• **Task 7** *Details may be seen at Annexure-I*
		Day 3	**Hour 1**	Configuring Windows Updates.	
			Hour 2	Deployment and Management of Updates.	
			Hour 3	Practical Exercise: Configuring JEA.	
			Hour 4	Troubleshooting Security Issues.	
		Day 4	**Hour 1**	Practical Task: Implementing Privileged Access Management.	
			Hour 2	Security Best Practices in Windows Server.	
			Hour 3	Review of Key Security Features.	

			Hour 4	Q&A Session.	
		Day 5	**Hour 1**	*Home Assignment Discussion (Task 20, Task 21, Task 22).*	
			Hour 2	Monthly Test 3.	
			Hour 3	Feedback Session.	
			Hour 4	Final Assessment.	
Week 8	**Remote Desktop Services and Web Services in Windows Server**	**Day1**	**Hour 1**	Motivational Lecture (For further detail, see Page No: 3 & 4).	
			Hour 2	Overview of Remote Desktop Protocol (RDP).	
			Hour 3	Configuring Session-Based Desktops.	
			Hour 4	Overview of Virtual Desktop Infrastructure (VDI).	
		Day 2	**Hour 1**	Configuring Personal and Pooled Virtual Desktops.	• **Task 8** *Details may be seen at Annexure-I*
			Hour 2	Remote Access Services Overview.	
			Hour 3	Configuring VPNs and NPS.	
			Hour 4	Introduction to Always On VPN.	
		Day 3	**Hour 1**	Overview of Microsoft IIS.	
			Hour 2	Configuring IIS Web Server.	

			Hour 3	Practical Exercise: Deploying Web Applications.	
			Hour 4	Troubleshooting Remote Desktop and Web Services.	
		Day 4	**Hour 1**	Security Best Practices in Remote Access.	
			Hour 2	Practical Task: Configuring VPNs.	
			Hour 3	Review and Q&A Session.	
			Hour 4	Feedback on Practical Tasks.	
		Day 5	**Hour 1**	Home Assignment Discussion (Task 23, Task 24, Task 25, Task 26).	
			Hour 2	Monthly Test 4	
			Hour 3	Feedback Session.	
			Hour 4	*Final Assessment.*	
Week 9	Installing and Managing Linux Servers	**Day1**	**Hour 1**	Success Stories (For further detail, see Page No: 3 & 4).	
			Hour 2	Introduction to Red Hat Enterprise Linux Server.	• **Task 9** *Details may be seen at Annexure-I*
			Hour 3	Server Requirements and Installation Basics.	
			Hour 4	Custom Partitioning in Linux.	
		Day 2	**Hour 1**	Logging into the Linux GUI and Console.	

			Hour 2	Understanding Virtual Terminals.	
			Hour 3	Introduction to Essential File Management Tools.	
			Hour 4	Working with Links, Tar, and Compressed Files.	
		Day 3	**Hour 1**	Understanding and Creating File Systems.	
			Hour 2	Mounting and Managing Partitions.	
			Hour 3	*Configuring Persistent Mounts in Linux.*	
			Hour 4	Troubleshooting File Management Tasks.	
		Day 4	**Hour 1**	Introduction to User and Group Management.	
			Hour 2	Configuring Permissions in Linux.	
			Hour 3	Implementing Advanced Access Control Lists (ACLs).	
			Hour 4	Troubleshooting User and Permission Issues.	
		Day 5	**Hour 1**	Home Assignment Discussion (Task 31, Task 32, Task 33).	
			Hour 2	Monthly Test 5.	
			Hour 3	Feedback Session.	
			Hour 4	Final Assessment.	

Week 10	**Advanced Linux Storage Management**	**Day1**	**Hour 1**	Overview of LVM and Stratis.	• **Task 10** *Details may be seen at Annexure-I*
			Hour 2	Creating and Resizing LVM Logical Volumes.	
			Hour 3	Introduction to VDO.	
			Hour 4	Managing VDO Features.	
		Day 2	**Hour 1**	Introduction to File System Options.	
			Hour 2	Making and Mounting File Systems.	
			Hour 3	Understanding Persistent Naming Attributes.	
			Hour 4	Configuring Systemd Mounts.	
		Day 3	**Hour 1**	Practical Exercise: Configuring Advanced Storage.	
			Hour 2	Troubleshooting Storage Configurations.	
			Hour 3	Best Practices in Linux Storage Management.	
			Hour 4	Review of Advanced Features.	
		Day 4	**Hour 1**	Practical Task: Configuring LVM and Stratis.	
			Hour 2	Practical Task: Managing XFS File Systems.	
			Hour 3	Review of Storage Tools.	

			Hour 4	Q&A Session.	
		Day 5	**Hour 1**	Home Assignment Discussion (Task 37, Task 39).	
			Hour 2	Monthly Test 6.	
			Hour 3	Feedback Session.	
			Hour 4	Final Assessment.	
Week 11	**Freelancing and Professional Portfolio Development**	**Day1**	**Hour 1**	Motivational Lecture(Forfurtherdetailplease see PageNo: 4)	
			Hour 2	Introduction to Freelancing.	
			Hour 3	Pros and Cons of Freelancing.	
			Hour 4	Ethical and Professional Practices in Freelancing.	
		Day 2	**Hour 1**	Creating Profiles on Freelancing Platforms (Fiverr, Upwork).	• **Task 11** *Details may be seen at Annexure-I*
			Hour 2	How to Craft Effective Gig Titles and Descriptions.	
			Hour 3	Adding Portfolio Links to Freelancing Profiles.	
			Hour 4	Practical Exercise: Setting Up Two Freelancing Gigs.	
		Day 3	**Hour 1**	Introduction to Professional Portfolios.	
			Hour 2	Selecting Work for Your Portfolio.	

			Hour 3	Using Platforms like Behance and Dribbble.	
			Hour 4	Practical Task: Uploading Work Samples to Portfolio Sites.	
		Day 4	**Hour 1**	Best Practices for Showcasing Projects.	
			Hour 2	Designing a Portfolio Layout.	
			Hour 3	Practical Task: Preparing Portfolio for Final Presentation.	
			Hour 4	Review and Feedback on Freelancing Profiles and Portfolios.	
		Day 5	**Hour 1**	Home Assignment Discussion (Freelancing and Portfolio Tasks).	
			Hour 2	Monthly Test on Freelancing Basics.	
			Hour 3	Feedback Session.	
			Hour 4	Final Review of Freelancing Profiles and Portfolios.	
Week 12	**Capstone Project and Job Market Preparation**	**Day1**	**Hour 1**	Success Stories (For further detail, see Page No: 3 & 4).	• **Task 12** *Details may be seen at Annexure-I* **Final Project**
			Hour 2	Introduction to Capstone Project Guidelines.	
			Hour 3	Researching and Defining Project Objectives.	
			Hour 4	Gathering Requirements and Planning Deliverables.	

		Day 2	**Hour 1**	Design Brief and Project Description.	
			Hour 2	Creating Rough Sketches and Wireframes.	
			Hour 3	Hands-on Practice: Developing Key Project Components.	
			Hour 4	Feedback Session on Capstone Progress.	
		Day 3	**Hour 1**	Finalizing Capstone Project Deliverables.	
			Hour 2	Preparing the Presentation.	
			Hour 3	Practicing Presentation Skills	
			Hour 4	Incorporating Feedback for Improvement.	
		Day 4	**Hour 1**	Introduction to Job Market Research.	
			Hour 2	Building a Targeted Resume.	
			Hour 3	Preparing for Job Interviews.	
			Hour 4	Networking Tips and Engaging with Potential Employers.	
		Day 5	**Hour 1**	Capstone Project Presentation to Peers/Trainers.	
			Hour 2	Skills Competition (For further detail, see Page No: 3 & 4).	
			Hour 3		

			Hour 4	Feedback on Project and Presentation. Final Assessment and Graduation.	

Tasks for Certificate in System Administration and Infrastructure Service

Task No.	Task	Description	Week
1.	**Introduction to Windows Server Administration**	Explore the principles of Windows Server Administration. Set up a server environment and configure basic roles like DHCP and DNS. Gain hands-on experience using tools like Windows Admin Center and PowerShell.	**Week 1**
2.	**Configuring Active Directory Domain Services (AD DS)**	Install and configure AD DS. Deploy domain controllers and explore Azure AD integration. Implement group policies to manage user settings and link them to organizational units (OUs).	**Week 2**
3.	**Certificate Services and Security Features**	Deploy certificate services and configure certificate templates. Learn the benefits of PKI in securing communication and data. Explore methods for implementing secure password policies and privileged access management in a Windows Server environment.	**Week 3**
4.	**Managing Network Infrastructure Services**	Configure and manage DHCP scopes, DNS zones, and IPAM. Set up remote access services and VPN connections. Troubleshoot DHCP and DNS services to ensure proper functionality.	**Week 4**
5.	**File Server and Storage Management**	Implement file sharing and configure storage spaces. Learn about data deduplication, iSCSI-based storage, and the distributed file system (DFS). Troubleshoot file server issues and practice configuring DFS namespaces and replication.	**Week 5**
6.	**Virtualization with Hyper-V**	Set up and configure Hyper-V. Create and manage virtual machines, including shielded VMs. Explore advanced Hyper-V features like storage management and Kubernetes in Windows Server. Perform a practical task on deploying and managing containers.	**Week 6**
7.	**High Availability and Disaster Recovery**	Plan and configure failover clustering and Hyper-V replicas. Implement Azure Site Recovery and Windows Server Backup. Practice disaster recovery planning and test high-availability scenarios in a virtualized environment.	**Week 7**

8.	**Windows Server Security Features**	Configure Just Enough Administration (JEA) and secure SMB traffic. Deploy and manage Windows Updates to maintain system integrity. Troubleshoot security issues and implement security best practices in Windows Server environments.	**Week 8**
9.	**Remote Desktop and Web Services**	Set up and configure Remote Desktop Protocol (RDP) and Virtual Desktop Infrastructure (VDI). Deploy and manage IIS web servers. Practice troubleshooting remote desktop and web service issues while following security best practices for remote access configurations.	**Week 9**
10.	**Linux Server Administration**	Install and manage Red Hat Enterprise Linux servers. Learn file system management, user and group management, and permissions configuration. Explore advanced storage management techniques, including LVM and Stratis.	**Week10**
11.	**Freelancing and Professional Development**	Learn to create professional freelancing profiles on platforms like Fiverr and Upwork. Craft effective gig titles and descriptions. Set up portfolios showcasing practical projects, and understand ethical and professional practices for freelancing.	**Week11**
12.	**Capstone Project: System Administration Solution**	Plan and execute a comprehensive project integrating all the skills learned. This project involves designing, implementing, and documenting a complete system infrastructure with Windows Server and Linux components, virtualization, and disaster recovery mechanisms. Present the final solution.	**Week12**

Annexure-IV:

Workplace/Institute Ethics Guide

Work ethic is a standard of conduct and values for job performance. The modern definition of what constitutes good work ethics often varies. Different businesses have different expectations. Work ethic is a belief that hard work and diligence have a moral benefit and an inherent ability, virtue, or value to strengthen character and individual abilities. It is a set of values-centered on the importance of work and manifested by determination or desire to work hard.

The following ten work ethics are defined as essential for student success:

1. **Attendance:**
   Be at work every day possible, plan your absences don't abuse leave time. Be punctual every day.
2. **Character:**
   Honesty is the single most important factor having a direct bearing on the final success of an individual, corporation, or product. Complete assigned tasks correctly and promptly. Look to improve your skills.
3. **Team Work:**
   The ability to get along with others including those you don't necessarily like. The ability to carry your weight and help others who are struggling. Recognize when to speak up with an idea and when to compromise by blend ideas together.
4. **Appearance:**
   Dress for success set your best foot forward, personal hygiene, good manner, remember that the first impression of who you are can last a lifetime
5. **Attitude:**
   Listen to suggestions and be positive, accept responsibility. If you make a mistake, admit it. Values workplace safety rules and precautions for personal and co-worker safety. Avoids unnecessary risks. Willing to learn new processes, systems, and procedures in light of changing responsibilities.
6. **Productivity:**
   Do the work correctly, quality and timelines are prized. Get along with fellows, cooperation is

the key to productivity. Help out whenever asked, do extra without being asked. Take pride in your work, do things the best you know-how. Eagerly focuses energy on accomplishing tasks, also referred to as demonstrating ownership. Takes pride in work.

7. **Organizational Skills:**

   Make an effort to improve, learn ways to better yourself. Time management; utilize time and resources to get the most out of both. Take an appropriate approach to social interactions at work. Maintains focus on work responsibilities.

8. **Communication:**

   Written communication, being able to correctly write reports and memos. Verbal communications,being able to communicate one on one or to a group.

9. **Cooperation:**

   Follow institute rules and regulations, learn and follow expectations. Get along with fellows, cooperation is the key to productivity. Able to welcome and adapt to changing work situations and the application of new or different skills.

10. **Respect:**

    Work hard, work to the best of your ability. Carry out orders, do what's asked the first time. Show respect, accept, and acknowledge an individual's talents and knowledge. Respects diversity in the workplace, including showing due respect for different perspectives, opinions, and suggestions.

List of Tools and Equipment's

Hardware:

- Laptop/Desktop: 16GB RAM, 512GB SSD, virtualization support.
- Optional: Entry-level server (e.g., Dell PowerEdge).
- Networking: Router, switch, Ethernet cables.

Software:

- OS: Windows Server 2019/2022, Linux (Ubuntu, Red Hat).
- Virtualization: Hyper-V, VMware, VirtualBox.
- Tools: PowerShell, Bash, LVM, Windows Storage Spaces.

Online Tools:

- Cloud platforms (AWS, Azure).
- E-learning (Google Classroom, Zoom)