

Virginia Western Community College

ITN 111

Server Administration (Windows Server 2019)

Prerequisites

ITN154

VCCS Course Description

Covers installation, configuration, administration, management, maintenance, and troubleshooting of a server in a networked environment.

Semester Credits: 4

Lecture Hours: 4

Required Materials

Textbook

- Hands-On Microsoft Windows Server 2019 3rd Edition by Jason Eckert Cengage
ISBN: 978-0357436158 Mindtap Digital Access Required

Other Required Materials:

None

VCCS COURSE OUTCOMES

- Summarize the different ways that Windows Server 2019 can be used within an on-premises or cloud environment
- Explain the purpose and function of Windows virtual machines and containers
- Outline the key features of Windows Server 2019
- Identify the differences between Windows Server 2019 editions
- Discuss the considerations necessary to plan for a Windows Server 2019 installation
- Describe the concepts and processes used to perform a Windows Server 2019 installation
- Outline common post-installation configuration tasks for Windows Server 2019
- Identify the different virtualization configurations that can be used to explore Windows Server 2019 within an IT lab environment
- Use Server Manager to monitor and manage Windows Server systems
- Install and use the Windows Admin Center to monitor and manage Windows Server systems

- Configure server hardware devices
- Use the System File Checker and Sigverif to verify system files
- Configure key Windows Server components within Control Panel and Device Manager
- Explain the purpose and configuration of the Windows Registry
- Identify the components, features, and usage of Windows PowerShell
- Use Windows PowerShell to manage a server
- Create PowerShell scripts for systems administration
- Install Hyper-V on a Windows Server 2019 host
- Explain the purpose and configuration of Hyper-V virtual switches
- Create virtual machines within Hyper-V Manager
- Modify virtual machine settings
- Use virtual machine checkpoints
- Outline the process used to configure and perform live migration
- Identify the purpose and usage of virtual machine replication
- Explain the methods used to perform rapid server deployment with Windows Server 2019
- Use virtual machine templates to create new virtual machines
- Install and configure WDS
- Use WDS to install Windows Server 2019
- Create and manage local user and group accounts
- Install and explain the purpose of Active Directory
- Outline the purpose of Active Directory objects, forests, trees, and trusts
- Describe the different types of Active Directory groups and their use within a forest
- Identify the features available within different domain and forest functional levels
- Describe how sites can be used to control Active Directory replication
- Outline the function of the Active Directory global catalog and UGMC
- Identify the different FSMO roles available within a domain and forest
- Describe scenarios in which Azure Active Directory can be used within an organization
- Use Active Directory Domains and Trusts to raise functional levels and create trust relationships
- View and raise functional levels using command line utilities
- Use Active Directory Sites and Services to manage sites and global catalog
- Use Active Directory Users and Computers to create and manage OU, user, group, and computer objects
- Describe the features available within the Active Directory Administrative Center
- Explain the purpose of RODCs, as well as the procedures used to install and manage them
- Describe the use and configuration of folder and file attributes
- Identify the permissions available for NTFS and ReFS folders and files
- Configure file ownership, permissions, and auditing
- Share folders using SMB and NFS

- Publish shared folders to Active Directory
- Implement DFS namespaces to simplify shared folder access
- Configure DFS replication to synchronize folder contents
- Restrict content using user quotas, folder quotas, and file screens
- Describe the process for printing documents to a print device or shared printer
- Configure and monitor a print server using the Print and Document Services role
- Use the Print Management tool to add and configure shared printers
- Deploy shared printers using Group Policy
- Manage print jobs
- Troubleshoot common printing problems
- Describe local storage options available for Windows Server 2019
- Create and manage simple and software RAID volumes
- Configure and connect to SAN storage
- Configure data deduplication
- Optimize and repair volumes
- Backup and restore data
- Describe the process used to resolve FQDNs using DNS
- Configure a DNS server
- Troubleshoot common DNS issues
- Configure a WINS server to provide for NetBIOS name resolution
- Describe the process used to obtain IP configuration using DHCP
- Configure a DHCP server
- Troubleshoot common DHCP issues
- Identify methods used to provide remote access in an organization
- Describe the components used to provide for VPN remote access
- Configure a remote access server for VPN remote access
- Configure RADIUS to support VPN remote access
- Describe how DirectAccess can be used to enable automated remote access
- Implement remote access using DirectAccess
- Identify the components that enable remote access using Remote Desktop and RemoteApp
- Configure Remote Desktop Services
- Describe the available cloud components, types, delivery models, and configurations
- Provide Web services using Internet Information Services (IIS)
- Configure Windows containers
- Implement a Linux Web server using the Windows Subsystem for Linux (WSL)
- Configure Linux Containers on Windows (LCOW)
- Outline scenarios for implementing Windows Server 2019 in a cloud environment
- Configure and manage GPOs
- Identify the structure and use of public key certificates
- Deploy certificates using an enterprise CA
- Protect WLAN access using 802.1X Wireless

- Use WSUS to manage the distribution of updates
- Configure Windows Defender settings, firewall rules, and IPSec
- Outline the process used to monitor and troubleshoot systems
- Use common monitoring and troubleshooting tools
- Troubleshoot common hardware, software, operating system, performance, and network problems

Note to Instructors

- All instructors are to use the same textbook
- All course sections are to follow the same basic course outline

TOPICAL DESCRIPTIONS

Chapter	Topics
Module 01	Getting Started with Windows Server 2019 • Using Windows Server 2019 within an Organization ○ Understanding Windows Server Virtualization ○ Understanding Windows Containers • Windows Server 2019 Features ○ Active Directory ○ Security ○ Volume and filesystem features ○ Performance and reliability ○ Administration tools ○ Small footprint installation options ○ Hybrid cloud features ○ Linux application support • Windows Server 2019 Editions ○ Windows Server 2019 Essentials Edition ○ Windows Server 2019 Standard Edition ○ Windows Server 2019 Datacenter Edition ○ Windows Storage Server 2019 ○ Microsoft Hyper-V Server 2019 ○ Preparing for a Windows Server 2019 Installation ▪ Installing Windows Server 2019 • Obtaining installation media • Starting the installation process • Completing the installation process ▪ Post-Installation Configuration • Setting the correct time and time zone • Configuring the Internet Protocol (IP) on the

	server's network interfaces • Configuring the firewall • Changing the default computer name and domain membership • Installing a modern Web browser • Activating the Windows Server operating system
Module 02	Configuring Windows Server 2019 • Working with Server Manager ○ Adding Roles and Features Using Server Manager ○ Using the BPA to Verify Server Roles • Working with the Windows Admin Center ○ Installing the Windows Admin Center ○ Using the Windows Admin Center • Configure server hardware devices ○ Adding Hardware Using Control Panel ○ Using Device Manager • Verifying System Files • Configuring Windows Settings ○ Configuring Performance Options ○ Configuring Environment Variables ○ Configuring Startup and Recover ○ Configuring Power Options • The Windows Registry ○ Windows Registry Contents • Using Windows PowerShell ○ Working with Windows PowerShell ○ System Administration Commands ○ Using WMI within Windows PowerShell ○ Creating PowerShell Scripts
Module 03	Implementing Hyper-V and Rapid Server Deployment • Implementing Hyper-V ○ Installing Hyper-V ○ Understanding Virtual Networks ○ Creating Virtual Machines ○ Configuring Virtual Machines ○ Managing Hyper-V Features ○ Working with Virtual Machines • Rapid Server Deployment ○ Using Virtual Machine Templates ○ Using Windows Deployment Service
Module 04	Introduction to Active Directory and Account Management • Working with Local Users and Groups

	• Active Directory Basics ○ Active Directory Objects ○ Active Directory Forests, Trees, and Trusts ○ Active Directory Groups ○ Domain and Forest Functional Levels ○ Site and Active Directory Replication ○ Global Catalog ○ FSMO Roles ○ Azure Active Directory • Installing Active Directory ○ Installing a Forest Root Domain ○ Installing a Domain within an Existing Forest ○ Installing a Domain Controller within an existing Domain • Configuring Active Directory ○ Raising Functional Levels ○ Creating Trust Relationships ○ Managing FSMO Roles ○ Configuring Sites and Replication ○ Configuring Global Catalog and UGMC • Managing Active Directory Objects ○ Working with Organizational Units ○ Working with User Objects ○ Working with Group Objects ○ Working with Computer Objects ○ Using the Active Directory Administrative Center • Read-Only Domain Controllers
Module 05	Configuring Resource Access • Configuring Folder and File Attributes ○ Working with Basic Attributes ○ Working with Advanced Attributes • Managing Folder and File Security ○ Configuring Folder and File Permissions ○ Configuring Folder and File Ownership ○ Troubleshooting Folder and File Permissions ○ Configuring Folder and File Auditing • Configuring Shared Folders ○ Sharing Folders Using SMB ○ Sharing Folders Using NFS ○ Publishing a Shared Folder in Active Directory • Implementing Distributed File System ○ Configuring DFS Namespaces ○ Configuring DFS Replication • Implementing Quotas and File Screens

	○ Configuring User Quotas ○ Configuring Folder Quotas ○ Configuring File Screens
Module 06	Configuring Printing ● Windows Printing Basics ○ The Printing Process ○ Printing to a Shared Printer ○ The Printing Process for a Shared Printer ● Configuring a Windows Server 2019 Print Server ○ Installing Print and Document Services ○ Configuring a Print Server ○ Adding Printers to a Print Server ○ Configuring Printer Properties ○ Using Group Policy to Deploy Shared Printers ○ Configuring Branch Office Direct Printing ● Managing Print Jobs ● Monitoring and Troubleshooting Printers
Module 07	Configuring and Managing Data Storage ● Windows Server 2019 Local Storage Options ○ Storage Devices ○ Partitions, Filesystems, and Volumes ○ Partition Types and Strategies ○ RAID Types and Strategies ● Creating and Managing Local Volumes ○ Using Disk Management ○ Using Server Manager ○ Using Storage Spaces Direct ● Accessing and Configuring SAN Storage ○ Connecting Windows Server 2019 to an iSCSI SAN Device ○ Connecting Windows Server 2019 to a Fibre Channel SAN Device ○ Using MPIO to Connect to Multiple SAN Devices ○ Configuring Windows Server 2019 as an iSCSI SAN Device ● Managing Volume Data ○ Enabling Data Deduplication ○ Optimizing Volumes ○ Repairing Volumes ○ Backing Up and Restoring Data
Module 08	Configuring and Managing Network Services ● Understanding DNS ○ The DNS Lookup Process ○ Authoritative DNS Types ○ Accessing DNS Server in Other Organizations

	○ Resource Records ● Configuring a DNS Server ○ Configuring Primary Zones ○ Creating Secondary Zones ○ Creating Stub Zones ○ Configuring Conditional Forwarders ○ Configuring Default Forwarders ● Troubleshooting DNS ○ Using nslookup ○ Using DNS Manager ○ Using Log Files ● Configuring WINS ○ Using WINS for NetBIOS Name Resolution ○ Configuring a WINS Server ● Understanding DHCP ○ The DHCP Lease Process ○ DHCP Relay ● Configuring DHCP ○ Creating a New Scope ○ Configuring Scopes ○ Configuring Filters ○ Configuring DHCP Fault Tolerance ● Troubleshooting DHCP
Module 09	Configuring and Managing Remote Access Services ● Understanding Organization Networks and Remote Access ● Understanding VPNs ○ Using VPNs for Remote Access ○ Using VPNs to Protect Network Traffic ○ VPN Protocols ○ VPN Authentication ○ Using RADIUS ● Implementing VPNs ○ Configuring a Remote Access Server ○ Configuring RADIUS ○ Connecting to a VPN Server ○ Creating a Demand-Dial Interface ● Understanding DirectAccess ● Implementing DirectAccess ● Understanding Remote Desktop ● Implementing Remote Desktop Services ○ Installing Remote Desktop Services ○ Configuring Remote Desktop Services ○ Configuring Collections

	○ Connecting to Remote Desktop Services
Module 10	Configuring Web Services and Cloud Technologies • Understanding the Cloud ○ Defining the Cloud ○ Cloud Types ○ Cloud Delivery Models ○ Cloud Storage ○ Understanding Continuous Deployment • Configuring Web Services ○ Installing IIS ○ Configuring IIS • Configuring Containers ○ Installing Docker ○ Obtaining Container Images ○ Running Containers ○ Running Hyper-V Containers ○ Common Docker Commands • Configuring the Windows Subsystem for Linux ○ Installing and Using WSL ○ Hosting Web Services Using WSL ○ Configuring Linux Containers on Windows • Implementing Windows Server 2019 in a Cloud Environment ○ Hosting Web Apps in a Public Cloud ○ Hosting Web Apps in a Private Cloud
Module 11	Managing and Securing Windows Networks • Configuring Group Policy ○ Configuring GPOs ○ Configuring GPO Settings ○ Managing GPOs • Deploying Public Key Certificates ○ Understanding Public Key Certificates ○ Installing an Enterprise CA ○ Configuring an Enterprise CA for Certificate Enrollment ○ Enrolling for Certificates • Implementing 802.1X Wireless ○ Configuring RADIUS for 802.1X Wireless ○ Configuring a WAP for 802.1X Wireless • Configuring Windows Server Update Services ○ Installing WSUS ○ Configuring WSUS ○ Configuring a WSUS GPO • Configuring Windows Defender ○ Configuring Windows Defender Features

	○ Configuring Windows Defender Firewall with Advanced Security
Module 12	Monitoring and Troubleshooting Windows Server 2019 ● Monitoring and Troubleshooting Methodology ● Monitoring and Troubleshooting Tools ○ Task Manager ○ Resource Monitor ○ Performance Monitor ○ Data Collector Sets ○ Event Viewer ○ Reliability Monitor ● Resolving Common System Problems ○ Hardware-Related Problems ○ Performance-Related Problems ○ Software-Related Problems ○ Operating System-Related Problems ○ Network-Related Problems

[TITLE IX STATEMENT](#)

[ADA STATEMENT](#)

