

Module 1: Introduction to PowerShell

- **Overview of PowerShell**
 - What is PowerShell?
 - History and evolution of PowerShell
 - PowerShell vs. Command Prompt and Bash
- **Getting Started with PowerShell**
 - Installing PowerShell (Windows, Linux, macOS)
 - The PowerShell Console and ISE (Integrated Scripting Environment)
 - Basic commands and cmdlets
 - Understanding the syntax

Module 2: PowerShell Basics

- **Understanding Cmdlets**
 - What are cmdlets?
 - Syntax and structure of cmdlets
 - Discovering and using cmdlets (Get-Command, Get-Help)
- **Working with Objects**
 - Introduction to objects in PowerShell
 - The pipeline concept
 - Manipulating objects (Select-Object, Where-Object, Sort-Object)
- **Common Cmdlets**
 - Working with files and directories (Get-ChildItem, Copy-Item, Move-Item)
 - Getting system information (Get-Process, Get-Service, Get-EventLog)
 - Managing processes and services

Module 3: Scripting and Automation

- **PowerShell Scripting Basics**
 - Writing and running scripts
 - Variables and data types
 - Commenting and documentation
- **Control Flow**
 - Conditional statements (if, else, switch)
 - Loops (for, foreach, while, do)

- Error handling (try, catch, finally)
- **Working with Functions**
 - Defining and using functions
 - Parameter passing and validation
 - Advanced functions and cmdlet binding

Module 4: Working with the File System

- **Navigating the File System**
 - Path syntax and providers
 - Working with paths (Resolve-Path, Join-Path)
- **File and Folder Management**
 - Creating, copying, moving, and deleting files and directories
 - Searching and filtering files
 - Access control and permissions

Module 5: Managing Windows with PowerShell

- **Managing the Registry**
 - Working with the registry provider
 - Querying and modifying the registry
- **Managing Windows Services**
 - Starting, stopping, and configuring services
 - Managing scheduled tasks
- **Windows Event Logs**
 - Querying event logs
 - Filtering and exporting events

Module 6: Remote Management with PowerShell

- **Introduction to PowerShell Remoting**
 - Enabling and configuring remoting
 - Using Invoke-Command and Enter-PSSession
 - Managing remote sessions
- **Advanced Remoting Techniques**
 - Running scripts on remote machines
 - Configuring PowerShell Remoting for large environments

- Using Just Enough Administration (JEA)

Module 7: Working with PowerShell Modules

- **Using PowerShell Modules**
 - Importing and using modules
 - Discovering available modules (Find-Module, Install-Module)
 - Creating and sharing custom modules
- **Managing Module Dependencies**
 - Managing module versions
 - Using PSGallery and private repositories

Module 8: Automating Azure with PowerShell

- **Introduction to Azure PowerShell**
 - Overview of Azure PowerShell modules
 - Authenticating to Azure
- **Managing Azure Resources**
 - Working with Azure VMs, storage, and networking
 - Automating resource creation and management
- **Advanced Azure Scripting**
 - Using scripts to manage complex Azure environments
 - Working with Azure Resource Manager (ARM) templates and PowerShell

Module 9: PowerShell for DevOps and CI/CD

- **PowerShell in DevOps**
 - Integrating PowerShell with CI/CD pipelines
 - Using PowerShell with Azure DevOps and GitHub Actions
- **Infrastructure as Code (IaC)**
 - Introduction to IaC with PowerShell
 - Using Desired State Configuration (DSC)
 - Managing Azure resources with ARM templates and PowerShell

Module 10: Advanced PowerShell Techniques

- **Error Handling and Debugging**
 - Advanced error handling strategies
 - Debugging scripts and functions

- **Performance Optimization**
 - Best practices for writing efficient PowerShell scripts
 - Profiling and optimizing performance
- **Security Best Practices**
 - Secure coding practices
 - Managing credentials and secrets securely
 - PowerShell logging and auditing

Module 11: PowerShell Desired State Configuration (DSC)

- **Introduction to DSC**
 - Overview and use cases
 - Setting up DSC environments
- **Creating DSC Configurations**
 - Writing and applying DSC configurations
 - Managing DSC resources and modules
- **Monitoring and Troubleshooting DSC**
 - Monitoring DSC compliance
 - Troubleshooting common DSC issues

Module 12: PowerShell and APIs

- **Working with REST APIs**
 - Consuming REST APIs with PowerShell
 - Authenticating with APIs
 - Parsing and processing JSON responses
- **Automating API Calls**
 - Automating repetitive tasks with APIs
 - Managing third-party services with PowerShell and APIs

Module 13: PowerShell in Cloud and Hybrid Environments

- **PowerShell in a Hybrid Cloud Environment**
 - Managing hybrid environments with PowerShell
 - Integrating on-premises and cloud resources
- **Using Azure Automation**
 - Introduction to Azure Automation

- Creating and managing runbooks
- Integrating Azure Automation with other services