



Western Technical College

10154110 Windows PowerShell Scripting

Course Outcome Summary

Course Information

Description	This course will introduce students to PowerShell and how Microsoft utilizes the language for administration and management of Windows servers and clients. PowerShell is built on the .NET runtime language which leverages functional cmdlets to perform both simple and complex tasks. Students will learn to access file systems, data stores, the registry—and employ specific cmdlets to install, manage and troubleshoot Windows features and roles.
Career Cluster	Information Technology
Instructional Level	Associate Degree Courses
Total Credits	3
Total Hours	72

Textbooks

Windows PowerShell in 24 Hours, Sams Teach Yourself. 1st Edition. Copyright 2015. Warner, Timothy L. Publisher: Pearson. **ISBN-13**: 978-0-672-33728-4. Required.

Program Outcomes

1. Implement computer networks.
2. Implement client systems.
3. Implement server operating systems.
4. Develop technical documentation.
5. Troubleshoot network systems.
6. Maintain the network infrastructure.

Course Competencies

1. **Explore Windows CMD shell.**

Assessment Strategies

1.1. Lab Activity

Criteria

You will know you are successful when:

- 1.1. you list multiple ways to open the CMD shell
- 1.2. you change and navigate to multiple directories
- 1.3. you execute a program from CMD shell
- 1.4. you explain the difference between a common user and administrator within the CMD shell
- 1.5. you change the CMD font size
- 1.6. you change the CMD windows size
- 1.7. you change the CMD background colors
- 1.8. you can view files and directories in CMD shell

Learning Objectives

- 1.a. Compare ways to open CMD shell
- 1.b. Describe steps involved in configuring CMD window colors and size
- 1.c. Explain how to navigate directories within CMD shell

2. Explore CMD shell utilities.

Assessment Strategies

- 2.1. Lab Activity

Criteria

You will know you are successful when:

- 2.1. you use the ping command to test network connections
- 2.2. you use netsh commands effectively
- 2.3. you show methods for stopping runaway programs
- 2.4. you execute copy and paste commands in the CMD window
- 2.5. you demonstrate how to edit commands
- 2.6. you demonstrate how to view CMD shell history
- 2.7. you use tasklist and taskkill utilities effectively

Learning Objectives

- 2.a. Describe common CMD shell utilities for networking
- 2.b. Demonstrate how to troubleshoot network problems using CMD utilities
- 2.c. Use copy and paste commands
- 2.d. Show auto-completion for commands and names

3. Explore CMD shell processing.

Assessment Strategies

- 3.1. Lab Activity

Criteria

You will know you are successful when:

- 3.1. you show how to stop runaway commands
- 3.2. you use I/O redirection
- 3.3. you use multiple commands on one line
- 3.4. you change the search path in the CMD environment
- 3.5. you set default environment variables
- 3.6. you group commands

Learning Objectives

- 3.a. Apply redirection of output to a file
- 3.b. Apply redirection of input from a file
- 3.c. Combine multiple commands on one line
- 3.d. Change default environment variables
- 3.e. Modify the search path to include users home directory

4. Create CMD shell batch files.

Assessment Strategies

- 4.1. Lab Activity
- 4.2. Project

Criteria

You will know you are successful when:

- 4.1. you use a script to prompt for a users input batch file
- 4.2. you write a simple FOR loop batch file
- 4.3. you write a complex FOR loop with multiple commands batch file
- 4.4. you write a basic IF statement batch file
- 4.5. You write a simple IF/ELSE statement batch file
- 4.6. you write a multiple command IF statement batch file
- 4.7. you use a GOTO statement in a batch file
- 4.8. you use a CALL statement in a batch file
- 4.9. you explain the use of a GOTO END statement

Learning Objectives

- 4.a. Create a batch file in notepad or notepad plus
- 4.b. Use an IF/ELSE statement in a batch file
- 4.c. Use a subroutine in a batch file
- 4.d. Use a for loop in a batch file

5. Explore Windows PowerShell.

Assessment Strategies

- 5.1. Lab Activity

Criteria

You will know you are successful when:

- 5.1. you apply an upgrade to Windows PowerShell
- 5.2. you demonstrate upgrading Windows PowerShell
- 5.3. you explore the Windows PowerShell help system
- 5.4. you use the help system to troubleshoot command errors
- 5.5. you search for applicable PowerShell Commands

Learning Objectives

- 5.a. Configure Windows PowerShell
- 5.b. Explore PowerShell help system
- 5.c. Discover PowerShell commands

6. Explore Windows PowerShell objects and the pipeline.

Assessment Strategies

- 6.1. Lab Project
- 6.2. Project

Criteria

You will know you are successful when:

- 6.1. you explain the properties of an object in PowerShell
- 6.2. you explain the properties of an object member
- 6.3. you understand how to reference individual objects
- 6.4. you use the GET-MEMBER command effectively
- 6.5. you explain data types
- 6.6. you describe the uses for pipelines
- 6.7. you use the pipeline to pass data types effectively between PowerShell commands
- 6.8. you demonstrate the use of the pipe output from a command to a file
- 6.9. you demonstrate how to sort the output of a command using ascending/descending
- 6.10. you demonstrate how to filter the output of a command to change the results of the display
- 6.11. you demonstrate how to sort based on multiple criteria
- 6.12. you group objects to customize output
- 6.13. you use Select-Object, Where-Object, and Sort-Object commands effectively
- 6.14. you use comparison operators

Learning Objectives

- 6.a. Explain how the pipeline works
- 6.b. Explore different outputs using sorting and filters
- 6.c. Explain the relationship between objects, properties, and methods
- 6.d. Use the pipeline to effectively pass data between objects

7. Format Windows PowerShell output.

Assessment Strategies

- 7.1. Lab Activity
- 7.2. Project

Criteria

You will know you are successful when:

- 7.1. you demonstrate how to select a prescribed number of results
- 7.2. you explore the difference between ascending and descending output
- 7.3. you demonstrate how to sort objects based their properties
- 7.4. you use the Group-Object cmdlet to separate output
- 7.5. your explain the differences between Select-Object, Where-Object, and Sort-Object
- 7.6. you create filters to select required output
- 7.7. you use filtering effectively in the pipeline
- 7.8. you use comparison operators to compare values and produce a Boolean result
- 7.9. you explain the purpose of a provider
- 7.10. you use Get-PSProvider to view default PowerShell providers

Learning Objectives

- 7.a. Use the ascending and descending sort features of PowerShell to control output
- 7.b. Use filtering techniques to represent desired results for PowerShell commands
- 7.c. Measure data in output through the use of the pipeline
- 7.d. Explore the functions or a provider

8. Demonstrate how to manage remote computers using Windows PowerShell.

Assessment Strategies

- 8.1. Lab Activity
- 8.2. Project

Criteria

You will know you are successful when:

- 8.1. you explain the benefits to PowerShell remote access
- 8.2. you enable PowerShell remoting
- 8.3. you configure a PowerShell remote session to another computer
- 8.4. you set up multiple PowerShell remote sessions
- 8.5. you use scripts through a PowerShell remote session
- 8.6. you establish a one-to-many PowerShell remote session
- 8.7. you demonstrate how to pass input using remote commands
- 8.8. you explain the purpose for using PSWA
- 8.9. you configure PowerShell Web Access (PSWA)
- 8.10. you demonstrate how to authenticate through a web browser using PSWA

Learning Objectives

- 8.a. Create a PowerShell remote session
- 8.b. Create one-to-many remote access
- 8.c. Create a PSWA gateway

9. Create Windows PowerShell scripts.

Assessment Strategies

- 9.1. Lab Activity
- 9.2. Project

Criteria

You will know you are successful when:

- 9.1. you create a PowerShell script using notepad
- 9.2. you create a PowerShell script using ISE
- 9.3. you execute a PowerShell script from a PowerShell window
- 9.4. you explore editing and troubleshooting script errors using PowerShell ISE
- 9.5. you explore help options in PowerShell ISE

Learning Objectives

- 9.a. Create a script using PowerShell
- 9.b. Explore the benefits of using PowerShell ISE to create and test scripts

10. Create scheduled jobs with PowerShell.

Assessment Strategies

- 10.1. Lab Activity
- 10.2. Project

Criteria

You will know you are successful when:

- 10.1. you use windows task scheduler to schedule a PowerShell script
- 10.2. you demonstrate how to start and stop a job using PowerShell
- 10.3. you suspend a restart a job
- 10.4. you demonstrate how to view and delete jobs from the queue
- 10.5. you describe the relationship between parent and child jobs
- 10.6. you demonstrate how to start a job using the As-Job cmdlet
- 10.7. you assign a job to a prescribed variable
- 10.8. you use the Invoke-Command to send a remote job to a computer
- 10.9. you demonstrate how to register a new job on a computer
- 10.10. you add triggers to a scheduled job

Learning Objectives

- 10.a. Schedule a script to run as a task
- 10.b. Schedule a job using PowerShell
- 10.c. Explain how PowerShell workflow works
- 10.d. Use WIM commands to gather information about remote computers
- 10.e. Use CIM commands to get information from remote computers

11. Create text string searches using regular expressions.

Assessment Strategies

- 11.1. Lab Activity
- 11.2. Project

Criteria

You will know you are successful when:

- 11.1. you explain how wildcard operators work in the search syntax
- 11.2. you define regular expressions
- 11.3. you explain how regular expressions are used to search text strings
- 11.4. you use the match parameter to extract results from text files or strings
- 11.5. you use Select-String to effectively extract data from text files or strings
- 11.6. you use Where-String to effectively extract data from text files or strings
- 11.7. you use anchors and ranges effectively with regular expressions
- 11.8. you explain the purpose of regular expression qualifiers
- 11.9. you explain the purpose of regular expression character classes

Learning Objectives

- 11.a. Use wildcard operator in a text search
- 11.b. Explore regular expressions
- 11.c. Use -match parameter to extract prescribed results from text strings and files
- 11.d. Use Select-String to find text in strings and files

12. Explain how PowerShell workflow functions.

Assessment Strategies

- 12.1. Lab Activity
- 12.2. Project

Criteria

You will know you are successful when:

- 12.1. you explain the components of PowerShell workflow
- 12.2. you explain how PowerShell workflow operates as a process
- 12.3. you explain the naming conventions involved with workflows
- 12.4. you expand on the parameters involved with creating a workflow
- 12.5. you write a PowerShell workflow
- 12.6. you run a PowerShell workflow as a job
- 12.7. you explain how PowerShell workflow operates on remote systems
- 12.8. you demonstrate how to suspend and resume a workflow

Learning Objectives

- 12.a. Write a PowerShell workflow
- 12.b. Schedule a workflow as a job