

## **55039: Windows PowerShell Scripting and Toolmaking (5 Days)**

### **Course Overview**

This five-day instructor-led course is intended for IT Professionals who have a working knowledge of Windows PowerShell. This course covers advanced Windows PowerShell topics, with an emphasis on building reusable tools. Introduces workflow, reinforces best practices, and teaches a variety of script development and toolmaking techniques.

### **Skills Gained**

- Describe the correct patterns for building modularized tools in Windows PowerShell
- Build highly modularized functions that comply with native PowerShell patterns
- Build controller scripts that expose user interfaces and automate business processes
- Manage data in a variety of formats
- Write automated tests for tools
- Debug tools

### **Who Can Benefit**

This course is intended for administrators in a Microsoft-centric environment who want to build reusable units of automation, automate business processes, and enable less-technical colleagues to accomplish administrative tasks.

### **Prerequisites**

- Experience at basic Windows administration
- Experience using Windows PowerShell to query and modify system information
- Experience using Windows PowerShell to discover commands and their usage
- Experience using WMI and/or CIM to query system information

## Course Outline

### Module 1: Tool Design

- Tools do one thing
- Tools are flexible
- Tools look native

### Module 2: Start with a Command

- Why start with a command?
- Discovery and experimentation

### Module 3: Build a Basic Function and Module

- Start with a basic function
- Create a script module
- Check prerequisites
- Run the new command

### Module 4: Adding CmdletBinding and Parameterizing

- About CmdletBinding and common parameters
- Accepting pipeline input
- Mandatory-ness
- Parameter validation
- Parameter aliases

### Module 5: Emitting Objects as Output

- Assembling information
- Constructing and emitting output
- Quick tests

### Module 6: An Interlude: Changing Your Approach

- Examining a script
- Critiquing a script
- Revising the script

### Module 7: Using Verbose, Warning, and Informational Output

- Knowing the six channels
- Adding verbose and warning output
- Doing more with verbose output
- Informational output

### Module 8: Comment-Based Help

- Where to put your help
- Getting started
- Going further with comment-based help
- Broken help

## **Module 9: Handling Errors**

- Understanding errors and exceptions
- Bad handling
- Two reasons for exception handling
- Handling exceptions in our tool
- Capturing the actual exception
- Handling exceptions for non-commands
- Going further with exception handling
- Deprecated exception handling

## **Module 10: Basic Debugging**

- Two kinds of bugs
- The ultimate goal of debugging
- Developing assumptions
- Write-Debug
- Set-PSBreakpoint
- The PowerShell ISE

## **Module 11: Going Deeper with Parameters**

- Parameter positions
- Validation
- Multiple parameter sets
- Value from remaining arguments
- Help messages
- Aliases
- More CmdletBinding

## **Module 12: Writing Full Help**

- External help
- Using PlatyPs
- Supporting online help
- About topics
- Making your help updatable

## **Module 13: Unit Testing Your Code**

- Sketching out the test
- Making something to test
- Expanding the test
- Going further with Pester

## **Module 14: Extending Output Types**

- Understanding types
- The Extensible Type System
- Extending an object
- Using Update-TypeInfo

**Module 15: Analyzing Your Script**

- Performing a basic analysis
- Analyzing the analysis

**Module 16: Publishing Your Tools**

- Begin with a manifest
- Publishing to PowerShell Gallery
- Publishing to private repositories

**Module 17: Basic Controllers: Automation Scripts and Menus**

- Building a menu
- Using UIChoice
- Writing a process controller

**Module 18: Proxy Functions**

- A proxy example
- Creating the proxy base
- Modifying the proxy
- Adding or removing parameters

**Module 19: Working with XML Data**

- Simple: CliXML
- Importing native XML
- ConvertTo-XML
- Creating native XML from scratch

**Module 20: Working with JSON Data**

- Converting to JSON
- Converting from JSON

**Module 21: Working with SQL Server Data**

- SQL Server terminology and facts
- Connecting to the server and database
- Writing a query
- Running a query
- Invoke-SqlCmd
- Thinking about tool design patterns

**Module 22: Final Exam**

- Lab problem
- Break down the problem
- Do the design
- Test the commands
- Code the tool