

## Linux Essentials

### Course Summary

**Length:** 3 Days

**Prerequisite:** Basic computer skills

**Recommendation Statement:**

Student should be able to use a computer monitor, keyboard, mouse. Student needs to be able to input commands and control characters from a keyboard.

**Course Description:**

For those new to Linux, this is the first course you will take.

The course starts at the beginner level and works into intermediate and advanced LINUX commands and utilities. The student is introduced to the LINUX Bash shell, the command line and command syntax. Although you will be exposed to the various windowing platforms available in LINUX, this course teaches UNIX at “the command line level” to develop a thorough understanding of the LINUX operating environment.

The student learns how to navigate the LINUX file systems and how to work with files, directories and permissions. The student will learn how to use the LINUX editors “ex” and “vi.” Once the student is comfortable with basic LINUX commands, they’ll move onto advanced power tools as well as how to customize the POSIX Bash shell.

The classroom labs are run in a real-world UNIX environment, are structured to allow you to learn by doing, and are developed to simulate “real world” situations. The hands-on labs progressively build your LINUX knowledge and command skills in a clear and concise manner.

Working in a controlled UNIX classroom environment with an expert instructor, you will learn LINUX concepts and commands. You will receive professional tips and techniques that will help you build your LINUX confidence and skills.

**Upon completion of this course, you should be able to:**

- Log in and log out of LINUX
- Use the Common Desktop Environment tools (CDE) and GNome window system
- Compose command-line strings to perform functions
- Navigate the directory tree
- Manipulate text files
- Create files and directories
- Back up and restore user files and directories
- Change permissions of files and directories
- Use the vi text editor
- Identify and modify initialization files
- Employ shell features to streamline command execution
- Use basic network commands
- Use commands to search directories and files
- List active user processes and selectively kill user processes

# LINUX Essentials

## Detailed Course Outline

### **Introduction to the UNIX Operating System**

- Describe the LINUX Operating Environment and OS releases
- UNIX standardization - an overview of standards in the UNIX community
- Describe Unix shells (which shells are available, compare the common Unix shells, how to choose a shell)
- Describe the Unix kernel

### **Establishing Communication**

- Logging in and starting a Unix session
- Window environments available to the UNIX user
- Understanding the UNIX command syntax
- Using the UNIX "help" facility: manual pages
- Using emulation programs to access the system (ie. Putty / X-Windows / Telnet / CDE - Common Desktop Environment / Gnome Desktop )
- Setting your terminal environment (stty)
- Executing commands from the command line; UNIX Command syntax
- Using the UNIX "help" facility: manual pages

### **Introduction to the Filing System**

- Examining UNIX files and directories
- Describe the UNIX file system and directory structure
- Navigating the UNIX directory hierarchy
- Understand the difference between full and relative paths
- Understanding the current and parent directories
- Understanding the differences between a Windows/DOS based filesystem and a UNIX JFS
- Differences between Windows (DOS) files and Unix files
- Describe mount points - mounting and unmounting filesystems
- Describe hard and symbolic links
- Describe home directories
- Disk space and checking the status of disks, filesystems, and directories (ie. du and df commands)

### **File Management**

- Creating directories
- Copying files and directories
- Moving and renaming files and directories
- Removing files and directories
- Using shell metacharacters
- Locating files by name, owner, type and other parameters using the 'find' command

### **UNIX Permissions**

- Understanding permissions
- File permissions
- Directory permissions
- Change permissions with symbolic mode
- Change permissions with absolute (octal) mode
- Determine and set the umask value

### **Redirection Filters and Pipes**

- Exploring standard input, standard output, and standard error
- Using filters
- Using pipes

## Using the vi Editor

- Understand the UNIX editors
- Understand the VI modes
- Creating/viewing/manipulating/saving/deleting files using the vi editor
- Using a .exrc file

## Introduction to shell scripts

- Creating simple shell scripts
- Choosing a Shells
- UNIX Shells and Variables
- Understanding the UNIX shells
- Displaying the default variables
- Creating/Removing user variables
- stty to set terminal types (backspace, etc.)

## Introduction to the POSIX shell

- Shells: Bourne, Korn, C, bash, Tcsh
- Startup Scripts (.profile, .kshrc)
- Using ENV for automatic environment tailoring
- Use Bourne and Bash shell variables
- Assign values to shell variables
- Display the value of shell variables
- Make variables available to subprocesses using the export statement
- Display the value of environment variables
- Unset shell and environment variables
- Customize the user environment using the .profile file
- Perform arithmetic operations
- Create and use aliases
- Display aliases and the values assigned to them
- Display the built-in aliases
- Customize the Bourne and Bash shell environments
- Use the tilde expansion and command substitution features of the Bash shell

## Using Aliases and Functions

- Introducing the alias concept
- Using functions
- Making your aliases and functions permanent
- Removing aliases and functions

## Command Editing and Command History

- Enabling command editing in the Bash shell
- Using history to recall commands
- The command history file

## System Status and Command Information

- Displaying system information and user status
- Determining command locations

## Multitasking Capabilities

- Introduction to multitasking in the UNIX environment
- Managing jobs and background processes
- Using the process table to manage processes
- Introducing delayed and detached jobs
- Display system processes
- Use processes and process identifiers (PIDs)

- Identify parent and child processes
- Terminate processes using the kill command
- Use the pgrep and pkill commands

### **Advanced File Management**

- Creating links
- Processing files with "awk", "tr", and "sed"
- Use awk/nawk commands from the command line
- Write awk programs to generate data reports from text files
- Write awk programs to generate numeric and text reports from text files

### **Command line data processing**

- Using awk to display file contents and process data
- Formatting files with the tr command
- Using UNIX filters to filter, sort and restructure data
- Use awk to scan text files or standard input to display specific data, change data format, and add text to existing data

### **Archiving User Data**

- Managing file space
- Archiving files and directories
- Compressing files
- Use the tar utility to store files
- Backup files with the tar and compress commands
- Use compression tools to save storage space (compress, gzip, etc)

### **Printing**

- lp, lpstat, cancel

### **Remote Connections**

- Connect remotely using telnet and ssh
- Remotely access a system using rlogin or ssh
- Transfer files with ftp and sftp (using the command line)

### **Remote Connections**

- Connect remotely using telnet and ssh
- Transfer files with ftp and sftp

### **Advanced File Management**

- Creating links
- Processing files with "awk", "tr", and "sed"
- Use awk/nawk commands from the command line
- Write awk programs to generate data reports from text files
- Write awk programs to generate numeric and text reports from text files

### **Regular Expressions and the grep Command**

- Use and describe regular expressions
- Describe the grep command
- Use the grep command to find patterns in a file
- Use the regular expression characters with the grep command
- Metacharacters
- The grep command

### **Command line database processing**

- Using awk to display file contents and process data
- Formatting files with the tr command
- Using UNIX filters to filter, sort and restructure data

- Use `awk` to scan text files or standard input to display specific data, change data format, and add text to existing data

### **Stream Editing with 'sed'**

- Use `sed` to perform noninteractive editing tasks
- Substituting text
- Deleting and printing lines
- Reading and writing files
- Multiple 'sed' editor functions
- Use regular expression characters with the `sed` command