

Bash Shell Scripting

Duration: 5 Days

Prerequisites: Linux knowledge will be beneficial

Course Objective: This course provides a comprehensive foundation in Linux and shell scripting, covering key topics such as the Linux environment, command-line basics, file and user management, and scripting techniques. Participants will learn to create and execute scripts, work with variables, arrays, and patterns, and utilize advanced features like loops, branching, and functions. The course also includes practical modules on awk, sed, and utility script writing, equipping learners with the skills to manage Linux systems and automate tasks efficiently.

Lab Requirement: Koenig-DC (<https://linuxlab.koenig-solutions.com>)

Module 1 – The Linux Environment

The Origin of Linux

Files and File Systems

Directories

Inodes and Links

Pipe and Socket Files

Device Files

Lab Session

Module 2 – Basics of Linux

Command Basics

Command-Line Editing

Multiple Commands

Multiline Commands

Command History

Directory Commands

Basic file permissions

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Module 3 – Working with files and users

Listing Files

Getting Help

Fixing the Display

Working with Files

Working with People

Lab Session

Module 4 - Working with Shell

What is a shell?

Types of shell

Shell features

Shell Aliases

Customizing Your Prompt

Built-In Versus Linux Commands

The Bash Hash Table

The Set and Shopt Commands

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Module 5 - Script Basics

Pseudo code before writing shell script

Creating a Script

Magic Sha-Bang

How to execute a script

Exit status

Shell Debugging Features

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Module 6 - Variables

Introduction to Variables

Variable Assignment

Displaying and using variables

Variable Attributes

Quoting Variables

Escape Characters

The eval Command

Concatenation and sub-strings

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Module 7 – Array variables

Creating array Variable

Substituting and counting

Using integer variables as element numbers

Lab Session

Module 8 – User Input

Reading user input

Positional parameters

Creating positional parameters

Lab Session

Module 9 – Designing Program Output

Variable attributes

Terminal echo

I/O Redirection

Pipe and tee

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Module 10 – Managing input and output

File descriptors

Reading / writing using file descriptors

Redirecting, parameter lists and 'here' documents

Creating parameter lists from input lines

Lab Session

Module 11 – Shell arithmetic

Creating Integer Variables

Using arithmetic operators and data

Lab Session

Module 12 – Branching and logic testing

Logic testing

Conditional operators

Multi-way branching and the 'case' statement

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Module 13 – Shell patterns

Basic expressions

Regular expressions

Meta-characters

Pattern combinations

Using Character Classes

The grep and egrep command

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Module 14 – Looping

The 'while' loop

The 'until' loop

The 'for' loop

Breaking out of a loop and continuing

The 'select' loop

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Module 15 – The 'getopts' Command

Processing arguments

The getopts and OPTARG variable

The OPTIND variable

Lab Session

Module 16 – Functions

Displaying current shell functions

Declaring and using functions

Variable scope

Function recursion

Lab Session

Module 17 – Traps, Signals and Script Control

Common signals

Running Scripts in Background Mode

Scheduling your script

Starting the Script at Boot Time

The trap commands

Lab Session

Module 18 – Introduction to 'awk'

Record processing

Pattern matching and relational expressions

Command line arguments

Lab Session

Module 19 – Introduction to 'sed'

Substituting text

Deleting and printing lines

Reading and writing files

Multiple 'sed' editor functions

Lab Session

Module 20 – Writing Utility Scripts

Creating Graphical Script

User Management Script

Directory Monitoring Script

User Login Monitoring Script