Red Hat Certified System Administrator (RHCSA) v10

This course is focused on:

- ⇨ System Administration
- ⇨ RHCSA Exam candidates

Course Duration:

- **56 Hours**, 2 Hours Per Session (2 weekly Sessions)
- **56 Hours**, 14 Classes, 4 Hours per session

Module 1: Introduction to Linux Operating System

- Introduction to Operating Systems
- Parts of Operating System
- Kernel, Shell & File
- History of UNIX and LINUX
- Linux and GNU Project
- Basic Concepts of Linux
- Identification of various Linux distributors

Mod 02: Preparing RHEL Installation & Lab Setup

- Planning a Linux Installation
- Linux Home Lab Setup Requirements
- Partitioning Requirements
- Linux Installation Method (Physical, Virtual, Cloud)
- Required Partitions for RHEL 10 Installation
- Dual Booting with Windows Operating System
- Download and Install VMware Workstation

Mod 03: Linux Installations & Basic Configuration

- Introduction of Virtualization Technology
- Create VM on VMware Workstation for RHEL 10
- Installation of RHEL on VMware Workstation
- Install RHEL instance of AWS cloud
- Configure BIOS/UEFI options for OS booting
- Details discussion about OS booting options
- Details discussion about Installation Summary
- Linux Installation Method (MBR and GPT)
- Configure Post installation on RHEL 10

Module 04: Getting started with RHEL 10

- The GNOME Desktop Environment
- Introduction to Linux shells and terminal
- Linux Virtual Console/Terminal
- Logging remote system through SSH
- Logging web interface using cockpit
- Linux Command Syntax, Options, Argument
- Examples of Simple Commands
- Linux Directory & File System introduction
- Navigating Linux Directory Paths
- Command-line File & Directory Management
- Files & Directory handling commands

Module 05: Linux Text Processing Tools

- Standard Input, Output and Error Concept
- Redirecting Output to a File
- Constructing and Using Pipelines
- Working with tail, head, cat, less, wc, echo
- Working with Regular Expressions 'grep'
- Familiar with Linux 'find', ' and 'locate'
- Documentation for Commands

Module 06: Linux Text Editors

- Why need text editor
- Different types of text editors
- Introduction to 'vi/vim' and 'gedit'
- Linux Text Editor Utilities (vim, nano, gedit)
- Working with Different 'vi/vim' Modes
- Editing, Replacing, Searching with 'vi/vim'
- Working with **'vim'** advanced features

Module 07: User and Group Administration

- Users and Groups Introduction
- Linux User Types and Database
- Primary Groups and Supplementary Groups
- Gaining Super user Access
- Running commands as root with SUDO
- Managing Local User Accounts
- Managing Local Group Accounts
- Managing User Passwords
- Managing User's Password Aging

Module 08: Linux File Permissions and ACLs

- Explore Linux File & Directory Types
- Linux standard file permissions
- Hard Link and Soft Link concepts
- Viewing File/Directory Permission and Ownership
- Linux User, Group and Other permission Concept
- Set permission using read, write and execute
- Linux Special Permissions SUID, SGID, Sticky bit
- Securing Files with ACLs
- Creating, modifying and deleting ACL's

Module 09: Linux Boot and Service Management

- Step by step Linux booting procedures
- Explain and Controlling the Boot Process
- Working with GRUB2 Boot loader
- Working with Linux Kernel
- Update Linux Kernel (CentOS/AlmaLinux)
- Introducing Linux Systemd
- Controlling RHEL daemon & Services
- Working with systemd unit and target
- Resetting root password

Module 10: Linux File System Management

- Understanding Linux file systems
- Identifying File Systems and Devices
- Managing MBR Partitions with **'fdisk'**
- Managing GPT Partitions with **'gdisk'**
- Creating File System (xfs, ext4, swap)
- Mount Points and **'/etc/fstab'** - Details
- Mounting and Un-mounting File Systems
- Working with USB, DVD, ISO, NTFS Partitions

Module 11: Linux LVM and SWAP Management

- Limitation of Standard Partitions
- Importance of Logical Volume Management (LVM)
- Creating Physical volumes (PV)
- Creating Volume Group (VG)
- Creating Logical Volume (LV)
- Extend Volume Group (VG)
- Extend Logical Volumes
- Resizing Logical Volumes
- Remove Logical Volumes
- Why need swap partition
- Create additional **'swap'** space

Mod 12: Linux Network Management (IPv4, IPv6)

- Understand Network Device Recognition
- Working with **NetworkManager** Services
- Introducing Network Manager tools (nmcli & nmtui)
- Configuring Host Name and Name Resolution
- Working with gateway and route table
- Configure Static and dynamic IP
- Configuring IPv4 Networking using **'nmtui'**
- Configuring IPv6 Networking **'nmcli'**
- Configuring IPv4 using GUI Interface

Module 13: Linux Package Management System

- Software Packages and RPM
- The Linux Package Management system
- Examining RPM Package Files
- RPM Install, Queries and verifying
- Dependency problems and Resolution
- Concept of Package Repositories
- Register system with Red Hat Portal
- Packages Install and Remove using DNF
- Enable Third-party Software Repositories (EPEL)

Module 14: Configuring OpenSSH Service

- What is the Secure Shell (SSH)?
- How SSH (Secure Shell) works?
- SSH Host Keys (Public and Private)
- Configuring SSH Key-based Authentication
- Password less SSH Login
- Customizing SSH Service Configuration
- Restricting SSH Logins (root)
- Putty and Open SSH Clients

Module 15: Linux Security & Firewall Services

- Introduction to Firewall Technologies
- Netfilter and Firewalld concepts
- Working with **'firewalld'** zones concepts
- Managing & Configure Firewall Settings
- IP, ICMP, Port, Service Filtering using **'firewalld'**
- Introducing SELinux Security
- Explanation of SELinux Modes
- Working with SELinux Security Context
- Managing SELinux port Labeling
- Working with SELinux Boolean

Module 16: Managing SELinux Security

- Introducing SELinux Security
- Linux System Security Model
- Explanation of SELinux Modes
- SELinux User, Role, Context, Lebel
- Working with SELinux Security Context
- Managing SELinux port Labeling
- Working with SELinux Boolean
- SELinux Troubleshooting

Module 17: Linux Advanced Storage and NFS

- Network Storage Types
- NFS Server Configuration and NFS Clients
- Manage Network-Attached Storage with NFS
- Setup an NFS server and export directories
- Review /etc/exports parameters and options
- Evaluate access to NFS exports
- Mount NFS server in NFS clients
- NFS Server Auto mount
- Mount NFS Exports with the Automounter

Module 18: Linux Compression & Backup Utilities

- Why Need Backup?
- Different types of Backup method
- Archive Files and Directories using 'tar'
- Discuss about different **'tar'** options
- Extract Compressed **'tar'** Archive
- Discuss about **gz, bz2** and **xz** Compression
- Compress and De-compress using 'gz, bz2, xz'
- Secure Copy/Backup Through **'scp'**
- Working with Rsyn file Backup

Module 19: Linux Scripting with Bash

- Introduction to Shell Scripting
- Creating and Executing First Shell Script
- Working with Shell Variables
- Passing Arguments to the Bash Script
- Executing Shell Commands with Bash
- Reading User Input in Bash Shell
- Working with Bash Statement
- Bash Conditional and Control Structures
- Working with Login and Non-Login shells
- System information through bash scripts

Module 20: Cron Process and Job Scheduling

- Introduction to Linux Scheduling
- Scheduling Recurring Jobs with 'cron'
- Scheduling System cron Jobs
- Explain cron job file format
- Running commands at particular times
- Identify various CRON entries and schedules
- Scheduling Future Linux Tasks

Module 21: RHEL 10 NTP Service Configuration

- Introduction to NTP Service
- Time Synchronization in Linux
- Chrony Overview
- Installing Chrony
- NTP Server Configuration
- Firewall Configuration
- NTP Client Configuration
- Time Sync Verification & Troubleshooting

Module 22: Linux Logs Files & System Journal

- Overview of Linux Logging System
- Common Log File Locations in Linux
- Viewing Logs Using Text-Based Tools
- Essential Log-Related Commands
- Working Kernel & Boot Logs
- Device & Kernel Driver Logs
- Systemd Unit Logging (journalctl -u)
- Working with SELinux & Audit Logs
- Using the System Journal (journalctl)

Mod 23: Linux Process Management and Tuning

- Linux process management introduction
- Parent processes and child processes
- System process and user processes
- Details explain of **"TOP"** command
- Background and Foreground Processes
- Controlling jobs using **'bg', 'fg', 'ctrl+z', 'ctrl+c'**
- Monitoring & Killing Process Activities
- Managing priority of Linux Process
- Introducing Performance Tuning
- Linux Performance tuning tools
- Linux system tuning using 'tuned'

Mod 24: Working with RHEL Container Services

- Limitation of Virtual Machine
- Virtualization vs Containerization
- Red Hat Containerization using **Podman**
- Podman architecture
- Running containers
- Managing container images
- Container networking basics
- Storage for containers
- Run a service inside a container
- Rootless containers