

DevOps Engineer – Beginners to Advance

Duration: 20 Days (8 hours)

Linux Basic Course Overview

Module 1 – Linux Fundamentals

- What is Linux
- Basic Linux Commands
- Understanding Linux File System Structure
- Creating Files and Directories
- Copying Files and Directories
- Basics of VIM Editor
- Managing Users
- Understand Linux File System Permissions
- Changing Permissions
- Managing Services
- Installing and Updating Software Packages with YUM

DevOps

Module 1 – Introduction to DevOps

- History of DevOps
- What is DevOps?
- Why DevOps?
- How Does DevOps work?
- Life Cycle of DevOps
- DevOps Tools
- DevOps Benefits

Git and GitHub

Module 1 – Git

- Introduction to Version Control System
- History of Git
- Git Basics
- States in Git
- Installing Git
- Configuration of Git
- Working with Repositories
- Basic Git Commands
- Working with Remotes
- Tagging
- Git Branching

Docker

- Introduction to Containers
- Introduction to Docker
- Downloading and Installing Docker
- Docker Essential Commands
- Docker Engine
- Running your First Container
- Docker Image

Build Image with Docker file
Private Registry
Storing and Retrieving Docker Images from Docker Hub
Networking Docker Containers
Data Persistence with Volumes

Certified Kubernetes Administrator

Module 1 – Core Concepts

Overview of Container Orchestration
Introduction to Kubernetes
Kubernetes Architecture

Module 2 – Installation, Configuration & Validation

Design a Kubernetes Cluster
Installation of Kubernetes Master and Nodes
Choose a Network Solution
Verify Installation

Module 3 – Managing Resources

Managing Pods
Managing Labels & Selector
Managing Replication Controller & Replica Set
Managing Service

Module 4 – Scheduling

Manual Scheduling
Taint and Tolerations
Node Selector
Node Affinity

Module 5 – Application Lifecycle Management

Overview of Deployment
Deployment Strategies
Managing Deployment
Canary Deployment
Blue-Green Deployment

Module 6 – Environment Variable

Plain Key
Config Map
Secret
Mount Variable as Volume

Module 7 – Storage

Volumes
Persistent Volumes
Persistent Volume Claim

Module 8 – Security

Kubernetes Authentication
Managing Users in Kubernetes
Service Account
Managing Roles and Role Binding
Managing Cluster Role and Cluster Role Binding
Security Context

Module 9 – Cluster Maintenance

OS Upgrade
Upgrade Cluster Version
Static Pod
ETCD Backup
Cron Job

Module 10 – Logging and Monitoring

Understand how to Monitor all Cluster Components
Understand how to Monitor Applications
Manage Cluster Components Logs
Manage Application Logs
Prometheus Tool

Module 11 – Networking in Kubernetes

Kubernetes Networking
Understand CNI
Understand Pod Networking Concepts
Configure DNS
Configure and Manage Ingress Rule
Namespace

Module 12 – Managing Helm Chart

Introduction to Helm
Helm Installation
Use community Helm Chart
Create Helm Chart
Upgrade Helm Chart
Downgrade Helm Chart

Module 13 – Troubleshooting

Troubleshoot ETCD Failure
Troubleshoot Kubelet Failure
Troubleshoot Container Runtime Failure
Troubleshoot Scheduler Failure

Ansible

Module 1 – Introduce Ansible

Introduction to Ansible
Current IT Automation State
Configuration Management
Ansible History
How Ansible Works?

Module 2 – Understanding of Ansible Framework

Case Study
Ansible way of Configuration Management
Infrastructure as a Code (IaC)
Idempotency
Ansible Terminologies

Module 3 – Ansible Deployment

Pre-requisites for Controller Node
Installation and Configuration
Ansible Configuration File
Pre-requisites for Managed Node
Ansible Inventory
Ansible Communication
Ansible Architecture

Module 4 – Ad-hoc Commands

Introduction to Ansible Module
Ad-hoc Remote Executions
Ansible Commands
Privilege Escalation

Module 5 – Managing Playbooks

YAML Structure
Ansible Playbooks
Structure of Playbook
Syntax Check of Playbook
Run Playbook

Module 6 – Variables in Ansible

Introduction to Ansible Variables
Defining Ansible Variable in Ansible Code
Use Variable File
Host Vars and Group Vars
Ansible Facts
Facts in Playbooks
Use Cases of Facts
Disabling Facts

Module 7 – Conditionals, Loops, Handlers and Error Handling

Conditionals in Ansible
Loops in Ansible
Loops with Variables
Notify and Handlers in Ansible
Register and Debug
Ignore Errors
Block and Rescue

Module 8 – Ansible Roles and Galaxy

- Introduction to Role
- Understanding Role Structure
- Managing Roles
- Introduction to Ansible Galaxy
- Download and Use Roles from Ansible Galaxy

Module 9 – Ansible Vault

- Introduction to Ansible Vault
- Encrypt and Decrypt Playbooks
- Use File as Password for Ansible Playbooks
- Ansible Vault Commands

Module 10 – Jinja 2 Templates

- Introduction to Jinja2 Template
- Create Jinja2 Template
- Template with Looping
- Template with Conditions

Module 11 – Linux Administration

- Managing Packages
- Managing Users and Groups
- Managing Partition
- Starting and Stopping Services
- Managing SSH Keys

Terraform with Azure

Module 1 – Introduction to Terraform

- Introduction to Terraform
- Infrastructure Automation
- Install Terraform
- Providers
- Resources
- Basic Syntax
- Exercise: Your First Script main.tf

Module 2 – Getting Started with Terraform

- Terraform Plan, Show, Apply and Destroy
- Exploring Terraform Registry
- Interpolation
- Tainting and Updating Resources
- Terraform Console and Output
- Terraform Variables
- Breaking Out Our Variable and Outputs
- Lab Exercise: Breaking Down main.tf into variables.tf, output.tf

Module 3 – Terraform Modules

- Introduction to Modules
- Module Repositories
- First Basic Module
- The Module Codes
- Main Terraform Code
- Using Git Repositories to Save Modules
- Lab Exercise: Modules for Docker
- Lab Exercise: The Docker Image Module
- Lab Exercise: Module the Container Platform
- Lab Exercise: Modules – The Root Module

Module 4 – Terraform Troubleshooting and Testing

- Terraform Plan Revisited
- Debugging the Script
- Terraform Testing
- Lab: Writing Test Scripts for Terraform
- Lab: Testing with Docker

Maven

Module 1 – Maven Basics

- How Maven Help a Developer?
- Setting up your first Maven Project
- First Maven Dependency
- Understand How to Build a Jar
- Maven Goals – Compile, Test and Install
- Understand Maven Build Life Cycle

Module 2 – Maven Dependency Management

- Understand Maven POM – Project Object Model
- Transitive Dependencies
- Excluding Dependencies in Maven
- Scope of a Dependency
- Versioning of Dependencies

Module 3 – How Does Maven Work?

- Maven Super POM and Effective POM – Convention over Configuration
- Understand How Maven Downloads Dependencies
- Maven Plugins
- Maven from Command Line

Module 4 – Advanced Maven

- Basics of Multi Module Maven Project
- Best Practices of Multi Module Maven Project
- Running Web Application in Tomcat
- Maven Commands – Tips and Tricks
- Creating Projects with Maven Archetypes

Azure DevOps

Module 1 – Introduction to Azure DevOps

What is Azure DevOps?
Why Azure DevOps?
Benefits of Azure DevOps

Module 2 – Automate Containerization with Azure DevOps Pipeline

Automatically Build Image and Push to Azure Container Registry
Once Image is Pushed then Deploy/Update to Kubernetes Cluster

Module 3 – Automate Ansible and Terraform with Azure DevOps Pipeline

Create Infrastructure using Terraform with Azure DevOps
Once Machines are Deployed then Automate Servers with Ansible

CI/CD Tool - Jenkins

Module 1 – Introduction to Jenkins

Introduction to Jenkins
Jenkins Installation
Introduction to Jenkins UI
Create First Job
Add Parameters to your Job

Module 2 – Add SSH Node Credentials in Jenkins

Install SSH Plugin in Jenkins
Add Credentials of Node
Integrate Node SSH Server with Jenkins

Module 3 – Build Job on Remote Machine

Deploy Web Server Automatically through Jenkins

Module 4 – Jenkins Security

Enable/Disable Login in Jenkins
Allow Users to Sign up
Create Users Manually in the Jenkins DB Create and Manage Roles for Jenkins Users

Module 5 – Jenkins and Maven

Introduction to Jenkins and Maven
Install the Maven Plugin
Clone Git Repository from Jenkins
Build a Jar using Maven
Test your Code
Deploy your Jar with Jenkins
Archive the artifact

Module 6 – Jenkins File

Introduction to Pipeline
Introduction to JenkinsFile
Install the Jenkins Pipeline Plugin
Creating First Pipeline

Add Multi-Stages to your Pipeline
Environment Variable
Post Actions

Module 7 – Jenkins and Maven

Introduction to Jenkins and Maven
Install the Maven Plugin
Clone Git Repository from Jenkins
Build a Jar using Maven
Test your Code
Deploy your Jar with Jenkins
Archive the artifact

Module 8 – Nexus and SonarQube

Storage Artifacts on Nexus
Storage Docker Images on Nexus
Check Bugs of Application using SonarQube

Module 9 – Build Auto Image and Deploy to Kubernetes with Jenkins

Create image using Jenkins then Push to Registry
Automatically Create/Update Image to Kubernetes with Jenkins

Module 10 – Monitoring Jenkins

Integrate ELK with Jenkins for Logging
Integrate Prometheus and Grafana for Monitoring

Jira Overview

Module 1 – Introduction

Introduction to Jira
Introduction to Agile Terms
Need of Jira
Introduction to Jira Terms
Setting up JIRA Cloud

Module 2 – Introduction to Confluence

Introduction to Confluence
Need of Confluence
Benefits of Confluence