DevOps – Syllabus

Course Duration: 18 hours

Course Summary:

1. DevOps & Agile Introduction – 1 Hour
2. Linux – 1.5 hours
3. Git + GitHub – 2 hours
4. Docker – 2 hours
5. Kubernetes – 4 hours
6. CI/CD Pipeline [Azure DevOps (or) Jenkins] – 3 hours
7. Terraform – 3 hours
8. Scripting [Python (or) PowerShell] – 1.5 hours

01 DEVOPS & AGILE INTRODUCTION

Agile

- Why Agile
- What is Agile
- Overview on Agile Roles, Ceremonies and Artifacts

DevOps

- Why DevOps
- What is DevOps
- DevOps Principles
- DevOps Lifecycle
- DevOps Automation tools and its usage

02 LINUX

- Linux OS & Bash
- Create Linux Server from Cloud (Azure or AWS)
- Putty installation
- Linux Basic Commands
- Directory Creation
- File Creation
- Vi Editor
- File Download
- User creation
- File Permissions
- Services start/stop/restart
- Package Installation
- Linux Process status
- CPU usage, Disk Usage
- Bash Shell scripts – creating and executing scripts

03 GIT + GITHUB

- Introduction to Version Control System
- Git Installation
- GitHub account creation
- Basic Concepts of Git
- Setup Git Repository Local and Remote

- Basic Git Commands
- Git Branches
- Git Push
- Token Generation in Github account
- Git Pull & Git Fetch
- GIt Merge
- Git Rebase
- Git Merge Conflict
- Git CherryPick
- GitHub - Pull Request (PR)

04 DOCKER

- Application deployment on Physical server
- Virtualization and Containerization
- What is Docker?
- Docker Installation
- Docker Architecture and components
- Docker Images
- Docker Container
- Account creation in DockerHub Registry
- Main Docker commands
- Debug commands
- Dockerfile – Build your own Docker Image
- Create Dockerfile for Nginx Container
- Docker Volumes - Persisting Data
- Create Dockerfile for Creating Apache Container
- App Store - Push images to DockerHub registry
- Deploy application on a cloud server
- Docker Compose - Run multiple Docker containers

05 KUBERNETES

- Containerization and Orchestration
- Intro to Kubernetes (K8s)
- Kubernetes Architecture & components
- K8s Cluster Creation in Cloud (Azure/ AWS)
- Kubectl – installation and intro
- YAML Configuration File
- Kubernetes resources - intro
- Pod creation – run containers
- Replica Set creation – collection of pods
- Rolling update & Recreate deployments
- Services - Connecting to Apps inside cluster
- Statefulset - Deploying Stateful Applications
- Deamonset
- Namespaces - Organizing Components
- Persistent Volume and Persistent Volume Claims
- Main kubectl commands

06 CI/CD PIPELINE - Azure DevOps (or) Jenkins

Azure DevOps

- Introduction to Build Automation
- Azure DevOps Introduction
- Hierarchy of tools in Azure DevOps
- Organization & Project - Creation

- Azure Boards
- Azure Repos
- Azure Pipeline
- Service Connections – connect Azure Devops with Azure Cloud
- Self-Hosted & Microsoft Hosted Agents - Servers to run Pipeline
- Build an application from Azure Repos
- Containerize the application and store it in Azure Container Registry
- Deploy the application into Azure Kubernetes Service

Jenkins

- Introduction to Build Automation
- Install Jenkins in AWS Server
- Jenkins UI & Install Build Tools in Jenkins
- Jenkins Basics Demo
- Freestyle Job
- Pipeline Job
- Jenkinsfile Syntax
- Create complete Pipeline
- Build, Containerize and deploy apps in K8s
- Credentials in Jenkins
- Webhooks - Trigger Pipeline Jobs automatically

07 TERRAFORM

- Introduction to Terraform
- Terraform Installation & Setup Terraform Project
- Terraform Providers
- Resources in Terraform
- Create & Destroy Terraform Resources
- Basic Terraform commands
- Create Terraform Files
- Terraform State
- Variables and Output values
- Meta Arguments
- Terraform Modules
- Remote State in Cloud Storage
  (Azure Storage Account or AWS S3)
- Terraform Import
- Terraform Refresh
- Data Sources in Terraform
- Terraform Workspace for Multi Environment

08 SCRIPTING - Python (or) PowerShell

Python

- Python use-cases
- Python & IDE Installation (VS Code)
- Variables & Datatypes

- Input from user & Output to terminal
- Operators
- If condition
- For & While loop
- Dictionary
- Function
- Modules

PowerShell

- PowerShell Introduction
- PowerShell IDE Usage
- Install Cloud Module
- PowerShell Concepts
- Connect to Cloud using PowerShell
- Create script to provision Cloud Resource