DevOps Course Content

1. Introduction to DevOps

- What is DevOps?
- DevOps Principles & Practices
- DevOps vs Traditional IT
- CI/CD Overview
- DevOps Tools and Workflow

2. Linux for DevOps

- Basic Linux Commands
- File System Management
- User Management & Permissions
- Process Management
- Networking & Firewall Basics
- Shell Scripting for Automation

3. Version Control with Git

- Introduction to Git
- Git Installation & Configuration
- Git Commands: Clone, Commit, Push, Pull, Merge
- Branching and Merging Strategies
- GitHub, GitLab, and Bitbucket Integration

4. Build Automation with Maven

- Introduction to Maven
- Maven Installation & Configuration
- POM.xml & Dependency Management
- Building & Packaging Applications
- Maven Repositories (Local, Remote, Central)

5. Continuous Integration with Jenkins

- Introduction to Jenkins
- Jenkins Installation & Configuration
- Creating and Managing Jobs
- Integrating Git, Maven, and Docker
- Jenkins Pipelines (Declarative & Scripted)
- Jenkins Plugins for Extended Functionality

6. Configuration Management with Ansible

- Introduction to Ansible
- Installing and Configuring Ansible
- Writing Playbooks & Roles
- Managing Servers with Ansible
- Ansible for Infrastructure Automation

7. Containerization with Docker

- Introduction to Containers & Docker
- Installing Docker and Running Containers
- Docker Images & Dockerfile
- Docker Networking & Volumes
- Docker Compose for Multi-Container Applications

8. Container Orchestration with Kubernetes

- Introduction to Kubernetes
- Kubernetes Architecture (Master & Worker Nodes)
- Setting up a Kubernetes Cluster
- Deploying Applications in Kubernetes
- Services, Ingress, and Load Balancing
- Helm Charts for Application Deployment

9. Infrastructure as Code with Terraform

- Introduction to Infrastructure as Code (IaC)
- Terraform Installation & Configuration
- Writing Terraform Scripts
- Managing AWS Infrastructure with Terraform
- Terraform State & Remote Backends

10. Code Quality & Security with SonarQube

- Introduction to SonarQube
- Installing & Configuring SonarQube
- Integrating SonarQube with Jenkins
- Code Analysis & Reporting
- Security & Best Practices

11. Artifact Repository Management with Nexus

- Introduction to Nexus Repository
- Installing and Configuring Nexus
- Managing Maven and Docker Repositories
- Integrating Nexus with CI/CD Pipelines

12. Monitoring & Logging with Prometheus & Grafana

- Introduction to Monitoring in DevOps
- Installing Prometheus & Grafana
- Monitoring Metrics and Logs
- Setting Up Alerts & Dashboards
- Kubernetes Monitoring with Prometheus & Grafana

13. Real-Time DevOps Project

- Setting Up a CI/CD Pipeline from Scratch
- Deploying a Full-Stack Application
- Automating Infrastructure with Terraform & Ansible
- Monitoring & Logging the Application
- Best Practices & Troubleshooting