DevOps Fundamentals Training: Git, Docker, Jenkins, and Kubernetes

Module 1 – Introduction to DevOps

- Overview of DevOps
- DevOps Culture
- Development and Operations Collaboration
- Application Lifecycle
- CI/CD Concepts
- Infrastructure as Code
- Overview of a Modern DevOps Toolchain
- Most Commonly Used DevOps Tools

Module 2 – Source Code Management with Git and GitHub

- Introduction to Version Control
- Git Installation and Configuration
- Local and Remote Repositories
- Commits and History
- Branch Management
- Merging and Conflict Resolution
- Pull Requests
- GitHub and Collaboration
- Feature Branch Workflow
- Introduction to GitFlow

Module 3 – Containerization with Docker

- Introduction to Containerization
- Docker Concepts
- Images and Containers
- Docker Engine and Docker Desktop
- Docker Hub
- Creating a Dockerfile
- Building Docker Images
- Volume Management
- Docker Networking
- Image Registry Management

Module 4 – Continuous Integration with Jenkins

- Introduction to Continuous Integration
- Jenkins Architecture
- Jenkins Installation and Configuration
- Jenkins Jobs

- Jenkins Pipelines
- Jenkinsfile
- GitHub Integration
- Automated Test Execution
- Jenkins Agents
- CI/CD Best Practices

Module 5 – Implementing a Complete CI/CD Pipeline

- Automating the Delivery Lifecycle
- GitHub and Jenkins Integration
- Automated Docker Image Builds
- Automated Validation and Testing
- Publishing to a Docker Registry
- Automated Deployment
- Error Handling and Notifications

Module 6 – Kubernetes: Deployment and Orchestration

- Introduction to Kubernetes
- Kubernetes Architecture
- Control Plane and Worker Nodes
- Pods
- ReplicaSets
- Deployments
- Services
- Ingress
- Automatic Scaling
- Self-Healing
- ConfigMaps
- Secrets
- Deployment Strategies
- Rolling Updates and Rollbacks

Module 7 – DevOps Capstone Project

- Source Code Management with GitHub
- Creating a Jenkins Pipeline
- Automated Docker Image Build
- Publishing to Docker Hub
- Deployment to Kubernetes
- Application Scaling
- Functionality Validation
- Basic Cluster Monitoring