

DevOps Course Content

1. Introduction to DevOps

- What is DevOps?
- DevOps lifecycle and principles
- Benefits of DevOps over traditional IT
- DevOps tools overview
- Understanding CI/CD pipeline

2. Linux Fundamentals (for DevOps)

- Basic Linux commands
- File systems and permissions
- Shell scripting basics
- Package management and system monitoring

3. Version Control System – Git & GitHub

- Introduction to Git
- Git architecture and workflow
- Branching, merging, and resolving conflicts
- GitHub repositories and collaboration
- Integrating Git with CI/CD tools

4. Continuous Integration (CI) – Jenkins

- Introduction to Jenkins
- Installing and configuring Jenkins
- Jenkins pipelines (Scripted & Declarative)
- Integrating Git, Maven, and Docker
- Jenkins plugins and automation

5. Build and Dependency Management – Maven

- Introduction to build automation
- Maven architecture and lifecycle
- Creating and managing POM files
- Building and deploying Java projects

6. Configuration Management – Ansible

- Introduction to Ansible and YAML
- Inventory and playbooks
- Roles and variables
- Automating configurations
- Ansible Vault and Galaxy

7. Containerization – Docker

- What is Docker?
- Docker architecture and components
- Creating Docker images and containers
- Dockerfile, Docker Hub, and Docker Compose
- Managing containers in production

8. Container Orchestration – Kubernetes

- Introduction to Kubernetes architecture
- Pods, ReplicaSets, Deployments
- Services and Ingress
- ConfigMaps and Secrets
- Helm charts and advanced deployments

9. Cloud Computing for DevOps

- Overview of cloud platforms (AWS, Azure, GCP)
- Deploying applications on AWS EC2
- Using S3, IAM, and CloudWatch
- Infrastructure as a Service (IaaS) and PaaS

10. Infrastructure as Code (IaC) – Terraform

- Introduction to Terraform
- Providers, resources, and variables
- Writing Terraform configuration files
- Deploying infrastructure on cloud
- Terraform state management

11. Continuous Monitoring & Logging

- Importance of monitoring in DevOps
- Tools: Prometheus, Grafana, ELK Stack
- Setting up alerts and dashboards
- Log aggregation and visualization

12. CI/CD Pipeline Automation

- Designing a full DevOps pipeline
- Integrating Git, Jenkins, Docker, Kubernetes
- End-to-end automation for deployments
- Testing and rollback strategies

13. DevSecOps (Security in DevOps)

- Integrating security tools into CI/CD
- Static and dynamic code analysis
- Container security best practices

14. Real-Time Projects & Case Studies

- Deploying a multi-tier web application using CI/CD
- Automating infrastructure setup using Terraform
- Monitoring application performance using Prometheus & Grafana

15. Interview Preparation & Certification Guidance

- Top DevOps interview questions
- Hands-on tasks & practical scenarios
- Resume preparation and mock interviews