DevOps Course Content

1. Introduction to DevOps

- What is DevOps?
- DevOps vs Traditional IT
- Benefits of DevOps
- DevOps Lifecycle (Plan → Develop → Build → Test → Release → Deploy → Operate → Monitor)

2. Version Control with Git and GitLab/GitHub

- Introduction to Git
- Basic Git Commands
- Git Branching Strategy (GitFlow, Trunk-Based)
- Pull Requests and Merge Requests
- CI/CD concepts overview

3. Continuous Integration (CI)

- What is CI?
- Setting up CI Pipelines
- Build and Test Automation
- Running Unit Tests
- Basic CI Example (GitLab CI / GitHub Actions / Jenkins)

4. Continuous Delivery and Deployment (CD)

- Difference between Continuous Delivery and Continuous Deployment
- Deployment Strategies (Blue-Green, Canary, Rolling Updates)
- Setting up CD Pipelines
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5. Infrastructure as Code (IaC)

- Introduction to IaC
- Terraform Basics
- Creating and Managing Infrastructure with Terraform
- Best practices (modules, remote state, backend)

6. Configuration Management

- Introduction to Configuration Management
- Ansible Basics
- Writing Playbooks
- Managing servers with Ansible

7. Containerization with Docker

- What is Docker?
- Creating Dockerfiles
- Building and Running Docker Containers
- Docker Compose Basics
- Best Practices for Docker

8. Container Orchestration with Kubernetes

- What is Kubernetes?
- Core Concepts: Pods, Services, Deployments, ConfigMaps, Secrets
- Basic kubectl commands
- Deploying applications to Kubernetes

9. Monitoring and Logging

- Why Monitoring is important?
- Introduction to Prometheus and Grafana
- Basics of Metrics, Alerts, and Dashboards
- Introduction to centralized logging (ELK Stack / Loki)

10. Real-world Projects

- Build a CI/CD pipeline for a sample app
- Dockerize an application and deploy on Kubernetes
- Set up Terraform to deploy infrastructure
- Configure Monitoring for an application