

## **Stage 1: Foundations of DevOps**

Core Concepts:

- What is DevOps?
- CI/CD pipelines
- Version control (Git, GitHub/GitLab)
- Agile & Scrum basics

Learn:

- Linux fundamentals (shell scripting, file system, permissions)
- Networking basics (DNS, HTTP/S, TCP/IP, firewalls)

## **Stage 2: Containerization with Docker**

Docker Essentials:

- Docker architecture & components
- Dockerfile creation
- Docker Compose
- Docker volumes & networks
- Image building & optimization

Learn:

- Best practices for containerizing applications
- Debugging containers
- Pushing images to Docker Hub or AWS ECR

## **Stage 3: Cloud Infrastructure with AWS**

AWS Core Services:

- EC2, S3, IAM, VPC, CloudWatch
- Elastic Load Balancer (ELB)
- Auto Scaling Groups
- RDS & DynamoDB

Learn:

- AWS CLI & SDKs
- Infrastructure design patterns
- Cost optimization & security best practices

## **Stage 4: Infrastructure as Code (IaC) with Terraform**

Terraform Essentials:

- Providers & resources
- State management
- Modules & workspaces
- Remote backends (e.g., S3 + DynamoDB)

Learn:

- Writing reusable Terraform modules
- Integrating Terraform with CI/CD
- Managing secrets with AWS Secrets Manager or Vault

## **Stage 5: Orchestration with Kubernetes**

Kubernetes Core Concepts:

- Pods, Deployments, Services
- ConfigMaps & Secrets
- Volumes & Persistent Storage
- Namespaces & RBAC

Learn:

- Helm charts
- Monitoring with Prometheus & Grafana
- Logging with Fluentd or ELK stack
- Autoscaling & rolling updates

## **Stage 6: CI/CD Pipelines**

Tools to Explore:

- Jenkins, GitHub Actions, GitLab CI/CD

- ArgoCD or Flux (for GitOps)
- SonarQube (code quality)
- Nexus/Artifactory (artifact management)

## **Stage 7: Security & Monitoring**

Key Areas:

- Secrets management (Vault, AWS Secrets Manager)
- Container security (Trivy, Aqua, Falco)
- Infrastructure scanning (Terraform compliance tools)
- SIEM tools (Splunk, ELK)

## **Stage 8: Advanced Topics**

- Service Mesh (Istio, Linkerd)
- Serverless (AWS Lambda, API Gateway)
- Observability (OpenTelemetry)
- Multi-cloud & hybrid cloud strategies