



DevOps Engineering & Cloud Automation

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DevOps Engineering & Cloud Automation

Mastering the Modern Infrastructure Ecosystem

Month 1: Core Fundamentals

Week 1: Introduction to DevOps

- **Class 1:** Course overview, Cloud/Git onboarding, Running Demo App locally, Ngrok exposure.
- **Class 2:** DevOps vs SDLC, Role of a DevOps Engineer, Soft skills & Troubleshooting.
- **Goal:** Local project setup and exposing it via Ngrok.

Week 2: Git & Version Control

- **Class 1:** Branching strategies, Repository roles, Restricting deletions/history.
- **Class 2:** Forking workflow, Remote upstream, Pull Requests, Deploying to Heroku/Render.
- **Goal:** Mastering Git workflow and initial cloud hosting.

Week 3: Linux & Basic Cloud (AWS)

- **Class 1:** AWS EC2, Security Groups, Linux Commands, Package Management (apt/systemctl).
- **Class 2:** Nginx Config, Route53 (DNS), SSL with Certbot, Automation with Cronjobs.
- **Goal:** Hosting Nginx on AWS with a custom domain and SSL.

Week 4: Single Instance 3-Tier Deployment

- **Class 1:** Three-Tier Architecture, Database setup, Backend implementation.
- **Class 2:** Frontend setup, AWS Deployment, Application updates, Architecture overview.
- **Goal:** Deploying a production-ready app using Nginx, PM2, and PostgreSQL.



Month 2: Automation & Infrastructure

Week 5: CI/CD with GitHub Actions

- **Class 1:** CI/CD concepts, YAML syntax, Workflows, Jobs, and Runners.
- **Class 2:** Automating 3-Tier deployment, SSH Actions, Secrets management, Zero-downtime.
- **Goal:** Automate deployments to reduce time from 10 mins to 3 mins.

Week 6: Monitoring & Logging

- **Class 1:** Monitoring fundamentals, Prometheus installation, Node Exporter, PromQL.
- **Class 2:** Visualization with Grafana, Creating Dashboards, Alerting & Incident Response.
- **Goal:** Mastering observability with Prometheus and Grafana.

Week 7: Intro to Terraform (IaC)

- **Class 1:** Terraform setup, EC2 provisioning, Modules, S3 Remote State.
- **Class 2:** Deploying 3-Tier app with Modules, User Data, Bastion Host setup.
- **Goal:** Provisioning complex infrastructure using code.

Week 8: Production-Ready Architecture

- **Class 1:** Public vs Private Subnets, RDS in Private Subnet.
- **Class 2:** Fully Private Architecture, NAT Gateway, Application Load Balancer (ALB).
- **Goal:** Designing highly secure VPC environments.



Month 3: Microservices & DevSecOps

Week 9: Auto Scaling & AWS CodePipeline

- **Class 1:** High Availability, Health Checks, Self-healing, Backend Auto Scaling.
- **Class 2:** AWS CodePipeline, Blue/Green Deployment, Auto-deploy to scaling groups.
- **Goal:** Building a cloud-native, self-healing production environment.

Week 10: Docker & Containerization

- **Class 1:** Docker vs Virtualization, Dockerfile for FE/BE, Pushing to DockerHub/ECR.
- **Class 2:** Multi-container setup with Docker-Compose, Log aggregation with Loki.
- **Goal:** Containerizing applications for consistency across environments.

Week 11: Kubernetes (K8s)

- **Class 1:** Cluster Setup, K8s Objects (Pod, Service, ReplicaSet).
- **Class 2:** Scaling with K8s, Ingress Controllers, Resource Management.
- **Goal:** Deploying scalable applications on a Kubernetes cluster.

Week 12: DevSecOps & Capstone Project

- **Class 1:** SonarQube, Unit testing, Load testing (Locust/K6), Security scanning.
- **Class 2:** Serverless (Lambda), IAM Roles/Policies, AWS SAA-C03 Certification roadmap.
- **Final Goal: Capstone Project Submission** (End-to-end CI/CD, IaC, and Monitoring).