DevOps in Cloud + Terraform

40-Hour Training Plan (5 Days, 8 Hours/Day)

Day 1: DevOps Foundation & Terraform Basics (8 Hours)

- **DevOps Overview (2 Hours)**
    - Introduction to DevOps
    - CI/CD, Infrastructure as Code (IaC)
    - DevOps tools landscape
    - GCP services in DevOps

- **Terraform Basics (6 Hours)**
    - Introduction to Terraform & IaC
    - Installing & Configuring Terraform
    - Terraform CLI & Workflow
    - Terraform State Management
    - Writing & Applying Basic Terraform Configuration
    - Variables & Outputs

Day 2: Terraform Intermediate Concepts (8 Hours)

- **Terraform Providers & Modules (4 Hours)**
    - Understanding Providers in GCP
    - Managing Terraform Modules
    - Using Existing Modules from Terraform Registry
    - Creating Reusable Modules

- **Terraform Workspaces & Remote State (4 Hours)**
    - Workspaces & Environments
    - Storing State in Google Cloud Storage (GCS)
    - Integrating Terraform with Cloud Build & GitOps

Day 3: Advanced Terraform in GCP (8 Hours)

- **Networking & Security in Terraform (4 Hours)**
    - VPC, Subnets, Firewalls, NAT Gateway

- o   IAM Roles & Policies

- o   Service Accounts & Secrets Management

- **Terraform Best Practices & Optimizations (4 Hours)**

  - o   Terraform Testing (Checkov, Terratest)

  - o   Terraform Linting & Security Scanning

  - o   Error Handling & Debugging

  - o   Performance Optimization Techniques

Day 4: Terraform Real-World Use Cases & Migration to GitHub Actions (8 Hours)

- **Terraform for Kubernetes & GKE (4 Hours)**

  - o   Deploying GKE Clusters with Terraform

  - o   Managing Kubernetes Resources via Terraform

  - o   Autoscaling & Monitoring GKE

- **Migrating from Codefresh to GitHub Actions (4 Hours)**

  - o   Understanding Codefresh Pipelines

  - o   GitHub Actions Overview & Workflow

  - o   Converting Codefresh CI/CD Pipelines to GitHub Actions

  - o   Handling Secrets & Environment Variables in GitHub Actions

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Day 5: Terraform Automation & DevOps Integration (8 Hours)

- **Terraform with CI/CD & GitHub Actions (4 Hours)**

  - o   Automating Terraform Deployments using GitHub Actions

  - o   Terraform Plan, Apply, & Destroy in GitHub Actions

  - o   Using GitHub Actions for Multi-Environment Deployments

  - o   Implementing Security & Compliance in CI/CD Pipelines

- **Final Project & Q&A (4 Hours)**

  - o   End-to-End Terraform Deployment on GCP with GitHub Actions

  - o   Migrating an Existing Codefresh Pipeline to GitHub Actions

  - o   Troubleshooting & Best Practices Discussion

  - o   Q&A & Wrap-Up

Lab Requirements:

- GCP Project with IAM Permissions

- Terraform installed on local machine

- Google Cloud SDK (gcloud CLI)