Google Cloud DevOps Engineer Course

Course Duration: 40 Hours **Course code: GCDE**

1. Course Overview

This course provides a comprehensive understanding of DevOps practices on Google Cloud Platform (GCP). It focuses on building CI/CD pipelines, automating infrastructure, managing containerized applications, and ensuring system reliability and scalability. Learners will gain hands-on experience with tools like Cloud Build, Cloud Deploy, Kubernetes Engine (GKE), and Google Cloud Operations Suite.

2. What you'll learn?

By the end of the course, you will be able to:

- Understand DevOps principles and practices on Google Cloud
- Build and manage CI/CD pipelines
- Deploy and manage containerized applications using Kubernetes (GKE)
- Automate infrastructure using Infrastructure as Code (IaC)
- Monitor, log, and troubleshoot applications and systems
- Implement high availability and scalability
- Optimize performance and cost in cloud environments
- Apply security best practices in DevOps workflows

3. Target Audience

- DevOps Engineers
- Cloud Engineers and Architects
- Software Developers
- Site Reliability Engineers (SREs)
- IT Professionals transitioning to DevOps roles

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4. Pre-Requisites

Before taking this course, you should have:

- Basic understanding of Google Cloud Platform (GCP)
- Knowledge of Linux and networking fundamentals
- Familiarity with scripting (Bash/Python)
- Understanding of containers and Docker (recommended)

5. Course content

Module 1: Course Introduction

- Course overview and objectives
- Introduction to DevOps culture
- Overview of GCP DevOps tools

Module 2: DevOps Fundamentals

- DevOps lifecycle and principles
- CI/CD concepts
- Agile and DevOps integration
- Collaboration and automation practices

Module 3: Source Code Management

- Version control with Git
- Repository management (GitHub / Cloud Source Repositories)
- Branching strategies
- Code collaboration workflows

Module 4: Continuous Integration (CI)

- Introduction to Cloud Build
- Creating CI pipelines
- Automated testing
- Artifact storage and management

Module 5: Continuous Delivery and Deployment (CD)

- Cloud Deploy overview
- Deployment strategies (blue-green, canary)
- Release management
- Rollback mechanisms

Module 6: Containerization with Docker

- Docker fundamentals
- Creating and managing containers
- Building images
- Container registries

Module 7: Kubernetes and GKE

- Introduction to Kubernetes
- Google Kubernetes Engine (GKE)
- Deploying applications on GKE
- Managing clusters and workloads

Module 8: Infrastructure as Code (IaC)

- IaC concepts and benefits
- Terraform basics
- Deployment Manager overview
- Automating infrastructure provisioning

Module 9: Monitoring and Logging

- Google Cloud Operations Suite
- Cloud Monitoring and Logging
- Metrics, dashboards, and alerts
- Troubleshooting techniques

Module 10: Reliability and Scalability

- Designing highly available systems
- Autoscaling and load balancing
- Disaster recovery strategies
- SRE principles (SLIs, SLOs, SLAs)

Module 11: Security in DevOps

- DevSecOps basics
- IAM and access control
- Securing CI/CD pipelines
- Vulnerability management

Module 12: Automation and Workflow Orchestration

- Automating workflows
- Event-driven architecture
- API integrations
- Scheduling and task automation

Module 13: Cost Optimization and Performance

- Cost management strategies
- Resource optimization
- Performance tuning
- Efficient scaling

Module 14: Troubleshooting and Best Practices

- Debugging pipelines and deployments
- Common DevOps issues
- Best practices for cloud operations
- Continuous improvement

Module 15: Real-World Use Cases and Capstone Project

- End-to-end CI/CD pipeline implementation
- Deploying scalable applications
- Industry use cases
- Final project and evaluation