

# Google Cloud API Developer Course

**Course Duration: 40 Hours**

**Course code: GCAD**

## 1. Course Overview

This five-day course focuses on designing, developing, securing, and managing APIs using Google Cloud Platform (GCP). It provides hands-on experience with Google Cloud services such as Apigee, Cloud Endpoints, Cloud Functions, and API Gateway. Learners will gain the skills to build scalable, secure, and high-performance APIs and integrate them with modern cloud-native applications.

## 2. What you'll learn?

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

- Understand API design principles and lifecycle management
- Build and deploy APIs using Google Cloud services
- Use Apigee and API Gateway for API management
- Secure APIs using authentication and authorization mechanisms
- Integrate APIs with serverless and microservices architectures
- Monitor, analyze, and optimize API performance
- Implement CI/CD pipelines for API deployment
- Troubleshoot API-related issues in cloud environments

## 3. Target Audience

- API developers and backend developers
- Cloud developers and engineers
- DevOps engineers
- Software architects and integration specialists

## 4. Pre-Requisites

Before taking this course, you should have:

- Basic knowledge of programming (Python, Java, Node.js, etc.)
- Understanding of RESTful APIs and web services
- Familiarity with cloud computing concepts
- Basic knowledge of HTTP/HTTPS protocols

## 5. Course content

### Module 1: Course Introduction

- Introduction and course logistics
- Overview of API development in the cloud
- Course objectives and lab setup

### Module 2: API Fundamentals and Design

- What are APIs and API types (REST, SOAP, GraphQL)
- RESTful API design principles
- API lifecycle and best practices
- API documentation using OpenAPI/Swagger

### Module 3: Introduction to Google Cloud Platform (GCP)

- Overview of GCP services
- Setting up GCP environment
- Identity and Access Management (IAM) basics
- Working with Cloud Shell and SDK

### Module 4: Building APIs with Cloud Functions and Cloud Run

- Introduction to serverless computing
- Creating APIs using Cloud Functions
- Deploying containerized APIs with Cloud Run
- Handling HTTP triggers and events

## Module 5: API Management with Apigee

- Overview of Apigee platform
- Designing and deploying API proxies
- Traffic management and policies
- API versioning and lifecycle management

## Module 6: API Gateway and Cloud Endpoints

- Introduction to API Gateway
- Deploying APIs using API Gateway
- Using Cloud Endpoints for API management
- Comparing Apigee vs API Gateway vs Endpoints

## Module 7: Securing APIs

- Authentication methods (API keys, OAuth 2.0, JWT)
- Authorization and access control
- Securing endpoints and data
- Implementing rate limiting and quotas

## Module 8: Data Integration and Backend Services

- Connecting APIs to databases (Cloud SQL, Firestore)
- Integrating with Pub/Sub
- Working with microservices architecture
- Handling data transformation

## Module 9: Monitoring and Logging

- Using Cloud Monitoring and Logging
- API performance tracking
- Setting up alerts and dashboards
- Debugging API issues

## Module 10: CI/CD for API Development

- Introduction to CI/CD pipelines
- Using Cloud Build for automation
- Automating API deployments
- Version control integration (Git)

## Module 11: Performance Optimization and Scaling

- Scaling APIs using serverless architecture
- Load balancing and caching
- Optimizing response times
- Managing high traffic scenarios

## Module 12: Error Handling and Troubleshooting

- Common API errors and solutions
- Debugging tools and techniques
- Handling failures and retries
- Logging best practices

## Module 13: API Analytics and Monetization

- API usage analytics
- Monitoring consumer behavior
- Introduction to API monetization models
- Managing API products

## Module 14: Best Practices and Governance

- API governance strategies
- Security and compliance considerations
- Documentation and versioning best practices
- Managing enterprise APIs

## Module 15: Capstone Project and Real-World Implementation

- Designing and deploying a complete API solution
- Securing and managing APIs using Apigee/API Gateway
- Monitoring and optimizing performance
- Final project and assessment

