

# Architecting with Google Cloud Platform: Infrastructure

**Course Duration: 40 Hours**

**Course code: AGCPI**

## 1. Course Overview

This five-day course focuses on designing and implementing robust infrastructure solutions on Google Cloud Platform (GCP). It covers core infrastructure components such as compute, storage, networking, and security, along with best practices for building scalable, resilient, and high-performance cloud architectures.

## 2. What you'll learn?

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

- Design scalable and reliable infrastructure on GCP
- Select appropriate compute, storage, and networking services
- Implement secure and highly available architectures
- Design hybrid and multi-cloud connectivity
- Optimize infrastructure for performance and cost
- Apply GCP best practices for architecture design
- Use automation and Infrastructure as Code (IaC)
- Monitor and troubleshoot cloud infrastructure

## 3. Target Audience

- Cloud Architects and Solutions Architects
- Infrastructure Engineers
- DevOps Engineers
- System Administrators
- IT professionals working with cloud infrastructure

## 4. Pre-Requisites

Before taking this course, you should have:

- Basic knowledge of Google Cloud Platform services
- Understanding of networking, compute, and storage concepts
- Experience with IT infrastructure or system administration
- Familiarity with command-line tools

## 5. Course content

Module 1: Course Introduction

- Course overview and objectives
- Role of infrastructure in cloud architecture
- Overview of GCP services

Module 2: Google Cloud Infrastructure Overview

- GCP global infrastructure (regions, zones)
- Resource hierarchy and project organization
- Billing and resource management

Module 3: Designing Compute Infrastructure

- Compute Engine architecture
- Machine types and scaling strategies
- Managed instance groups
- Autoscaling and load distribution

Module 4: Designing Storage Solutions

- Cloud Storage design and use cases
- Persistent disks and local SSDs
- Filestore architecture
- Data lifecycle and backup strategies

## Module 5: Designing Database Infrastructure

- Cloud SQL, Spanner, Bigtable, Firestore
- Choosing the right database
- High availability and replication
- Backup and recovery planning

## Module 6: Networking Architecture Design

- Virtual Private Cloud (VPC) design
- Subnetting and IP planning
- Firewall rules and routing
- Shared VPC and network segmentation

## Module 7: Load Balancing and Traffic Management

- Global and regional load balancing
- Traffic routing strategies
- Health checks and failover
- CDN integration

## Module 8: Hybrid Connectivity and Multi-Cloud

- Cloud VPN and Cloud Interconnect
- Hybrid architecture design
- Multi-cloud strategies
- DNS and traffic routing

## Module 9: Security Infrastructure Design

- IAM roles and policies
- Identity management
- Encryption and key management
- Security best practices

## Module 10: Reliability and High Availability

- Designing for fault tolerance
- Multi-zone and multi-region deployments
- Disaster recovery strategies
- SLA considerations

## Module 11: Performance Optimization

- Resource optimization techniques
- Caching and latency reduction
- Performance monitoring tools
- Benchmarking strategies

## Module 12: Cost Optimization and Governance

- Cost estimation and budgeting
- Resource utilization optimization
- Billing and monitoring
- Governance policies

## Module 13: Automation and Infrastructure as Code

- Deployment Manager overview
- Terraform basics
- Automation strategies
- CI/CD integration

## Module 14: Monitoring and Operations

- Cloud Monitoring and Logging
- Alerts and incident management
- Troubleshooting infrastructure issues
- Operational best practices

## Module 15: Real-World Architecture Scenarios

- Designing enterprise infrastructure
- Use case-based architecture design
- Common challenges and solutions
- Best practices

## Module 16: Course Summary and Assessment

- Review of key concepts
- Hands-on design exercise
- Assessment and feedback
- Next steps and certification roadmap

