

# Architecting with Google Compute Engine

## Course Outline

The course includes presentations, demonstrations, and hands-on labs.

### Module 1: Introduction to Google Cloud

- List the different ways of interacting with Google Cloud.
- Use the Cloud Console and Cloud Shell.
- Create Cloud Storage buckets.
- Use the Google Cloud Marketplace to deploy solutions.

### Module 2: Virtual Networks

- List the VPC objects in Google Cloud.
- Differentiate between the different types of VPC networks.
- Implement VPC networks and firewall rules.
- Implement Private Google Access and Cloud NAT.

### Module 3: Virtual Machines

- Recall the CPU and memory options for virtual machines.
- Describe the disk options for virtual machines.
- Explain VM pricing and discounts.
- Use Compute Engine to create and customize VM instances.

### Module 4: CloudIAM

- Describe the Cloud IAM resource hierarchy.
- Explain the different types of IAM roles.
- Recall the different types of IAM members.
- Implement access control for resources using Cloud IAM.

### Module 5: Storage and Database Services

- Differentiate between Cloud Storage, Cloud SQL, Cloud Spanner, Cloud Firestore and Cloud Bigtable.
- Choose a data storage service based on your requirements.
- Implement data storage services.

### Module 6: Resource Management

- Describe the cloud resource manager hierarchy.
- Recognize how quotas protect Google Cloud customers.
- Use labels to organize resources.
- Explain the behavior of budget alerts in Google Cloud.
- Examine billing data with BigQuery.

## Module 7: Resource Monitoring

- Describe the services for monitoring, logging, error reporting, tracing, and debugging.
- Create charts, alerts, and uptime checks for resources with Cloud Monitoring.
- Use Cloud Debugger to identify and fix errors.

## Module 8: Interconnecting Networks

- Recall the Google Cloud interconnect and peering services available to connect your infrastructure to Google Cloud.
- Determine which Google Cloud interconnect or peering service to use in specific circumstances.
- Create and configure VPN gateways.
- Recall when to use Shared VPC and when to use VPC Network Peering.

## Module 9: Load Balancing and Autoscaling

- Recall the various load balancing services.
- Determine which Google Cloud load balancer to use in specific circumstances.
- Describe autoscaling behavior.
- Configure load balancers and autoscaling.

## Module 10: Infrastructure Modernization

- Automate the deployment of Google Cloud services using Deployment Manager or Terraform.
- Outline the Google Cloud Marketplace.

## Module 11: Managed Services

- Describe the managed services for data processing in Google Cloud.