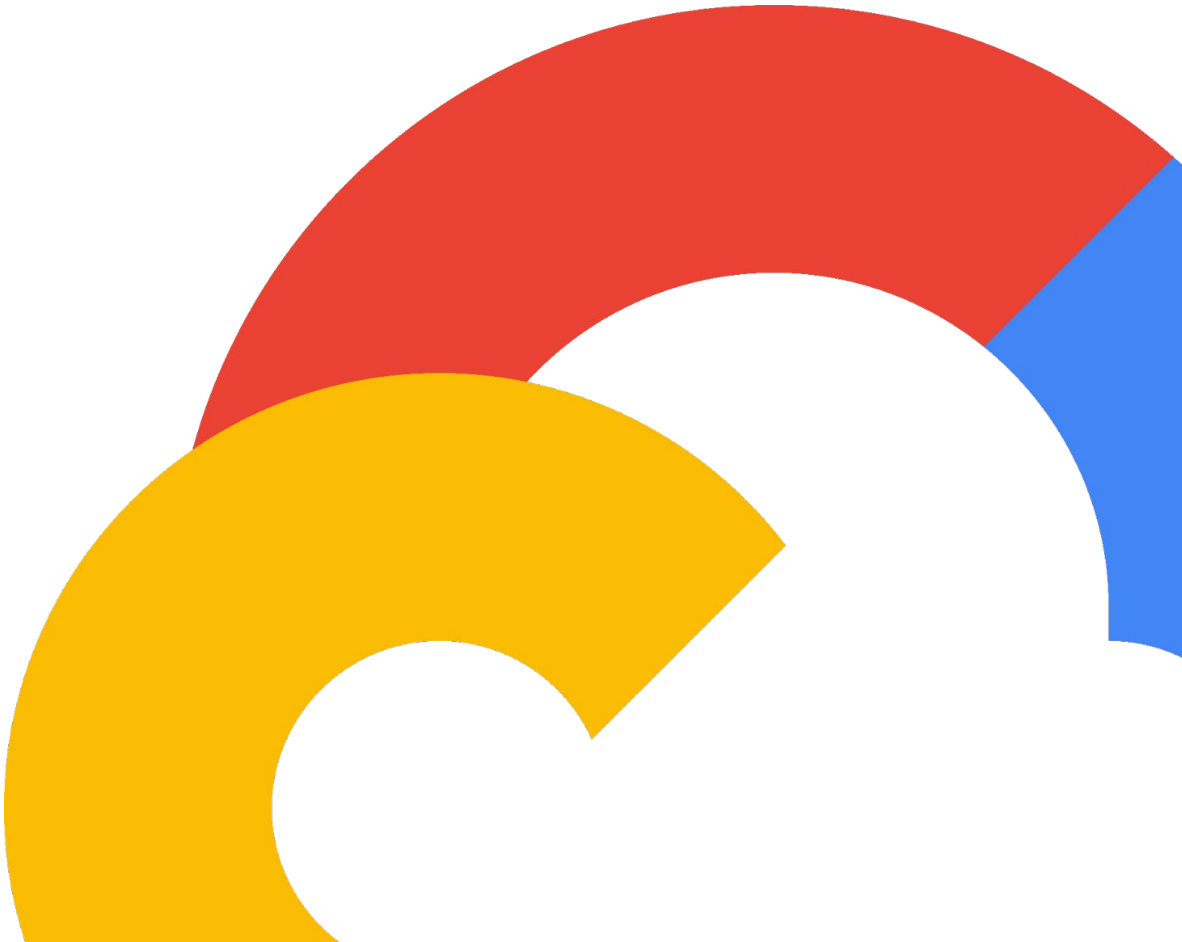
Google Cloud

Google Cloud Computing Foundations Certificate

2025



Proprietary & Confidential

Google Cloud

Why Cloud?

Moving data to the cloud offers companies the agility to share and process data in multiple locations around the world, increasing the speed with which data is shared, and the ability of stakeholders to access data in real-time all while tapping into this multi-billion dollar market.

Google Cloud Computing Foundations Certificate

This certificate program provides individuals with little to no background or experience in cloud computing a detailed overview of concepts covering cloud basics, big data, and machine learning and where and how Google Cloud fits in. The course starts with an overview of cloud computing and dives deeper into two areas - cloud computing infrastructure, and big data and machine learning. It enables learners to develop technical proficiency in cloud computing and launch or pivot to careers in a cloud-first world.

A college degree is not a prerequisite, but learners should have basic IT knowledge and be interested in learning more about cloud and machine learning. This includes a basic understanding of shell scripting and SQL, and competency in at least one computer language is helpful, though not required. The content provides learners with foundational knowledge and skills in cloud-based computing.

There are four courses in the Google Cloud Computing Foundations Certificate. In each course, learners will complete hands-on labs that allow them to practice key skills and produce work examples to show potential employers.

4 courses

10 modules

104 videos

25 labs

4 documents

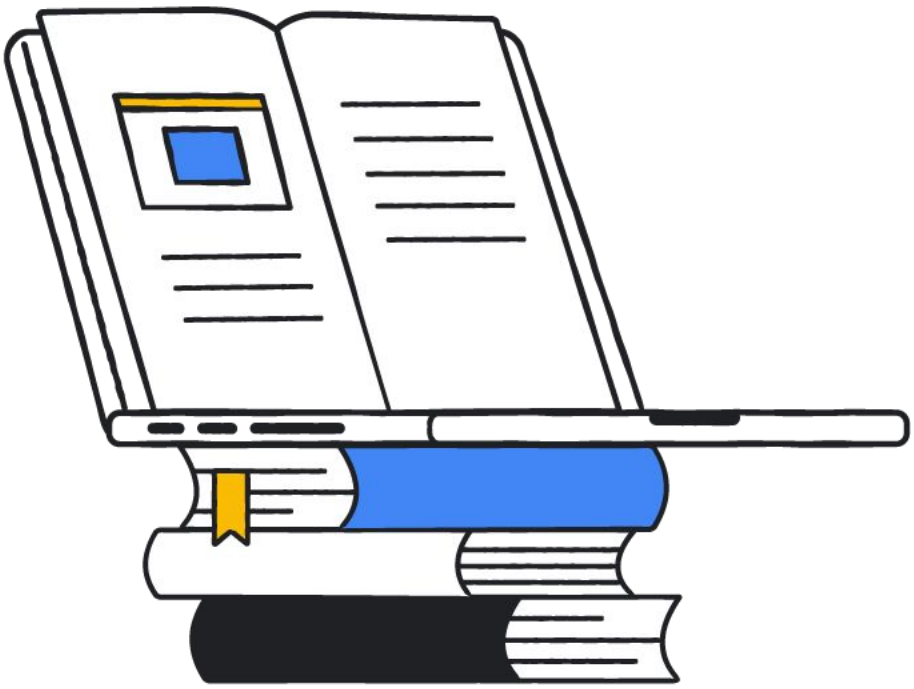
10 quizzes

4 skill badges

~ 40-50 hours to complete

Google Cloud

Courses



Certificate

1. Google Cloud Computing Foundations: Cloud Computing Fundamentals

Course Overview

This course introduces learners to cloud computing. Learners will understand what the cloud is and why it's a technological and business game changer, describe the different ways a user can interact with Google Cloud, and discover the different compute options in Google Cloud.

By the end of this course, learners will:

- Discuss cloud computing and identify advantages to leveraging the cloud.
- Compare and contrast physical, virtual, and cloud architectures.
- Define Iaas, PaaS, and SaaS.
- Discuss how to navigate the cloud with Cloud Console and explain the purpose and process of creating Google Cloud projects.
- Describe how APIs work and how to test Google APIs using Google API Explorer.
- Explore the role of compute options in the cloud.
- Describe building and managing virtual machines.
- Explain building elastic applications using autoscaling.
- Discuss building event-driven services using Cloud Functions.

Course Outline

Module 1: So, what's the cloud anyway?
Module 2: Start with a solid platform
Module 3: Use Google Cloud to build your apps



~ 6 hours to complete

Certificate

2. Google Cloud Computing Foundations: Infrastructure in Google Cloud

Course Overview

This course introduces learners to cloud storage, APIs, and cloud security. Learners will implement a variety of structured and unstructured storage models, discuss the different application managed service options in the cloud, and outline how security in the cloud is administered in Google Cloud.

By the end of this course, learners will:

- Compare and contrast physical storage and cloud storage options and distinguish between structured and unstructured storage options in the cloud.
- Explain relational database options in the cloud and describe the NoSQL options in Google Cloud.
- Discuss the purpose of APIs and explain the format of a REST API.
- Explore the use case for a managed messaging service.
- Describe the shared security model in the cloud.
- Discuss Google's security responsibility versus a customer's responsibility.
- Explore the different encryption options.
- Identify best practices when configuring authentication and authorization.

Course Outline

Module 1: Where do I store this stuff?

Module 2: There's an API for that!

Module 3: You can't secure the cloud, right?



~ 5 hours to complete

Certificate

3. Google Cloud Computing Foundations: Networking & Security in Google Cloud

Course Overview

This course introduces learners to networking and security. Learners will demonstrate how to build secure networks in the cloud and identify cloud automation and management tools.

By the end of this course, learners will:

- Explore basic networking in the cloud and explain the use of public and private IP addresses.
- Discuss how to build virtual private clouds (VPCs).
- Explore the role of firewall rules and routes.
- Explore hybrid cloud networking options including virtual private networks, interconnect, and direct peering.
- Differentiate between load balancing options in the cloud.
- Discuss Cloud Deployment Manager as an IaC option.
- Explain the role of monitoring, logging, tracing, debugging, and error reporting in the cloud.

Course Outline

Module 1: It helps to network

Module 2: Keeping an eye on things



~ 5 hours to complete

Certificate

4. Google Cloud Computing Foundations: Data, ML, and AI in Google Cloud

Course Overview

This course introduces learners to data, machine learning, and artificial intelligence. Learners will discover a variety of managed big data services in the cloud and explain what machine learning is, the terminology used, and its value proposition.

By the end of this course, learners will:

- Discuss big data managed services in the cloud.
- Describe using Dataproc to run Spark, Hive, Pig, and MapReduce as a managed service in the cloud.
- Discuss BigQuery as a managed data warehouse and analytics engine.
- Introduce machine learning in the cloud.
- Explore building bespoke machine learning models using Vertex AI.
- Leverage AutoML to create custom machine learning models.
- Apply a range of pre-trained machine learning models using Google's machine learning APIs.

Course Outline

Module 1: You have the data, but what are you doing with it?

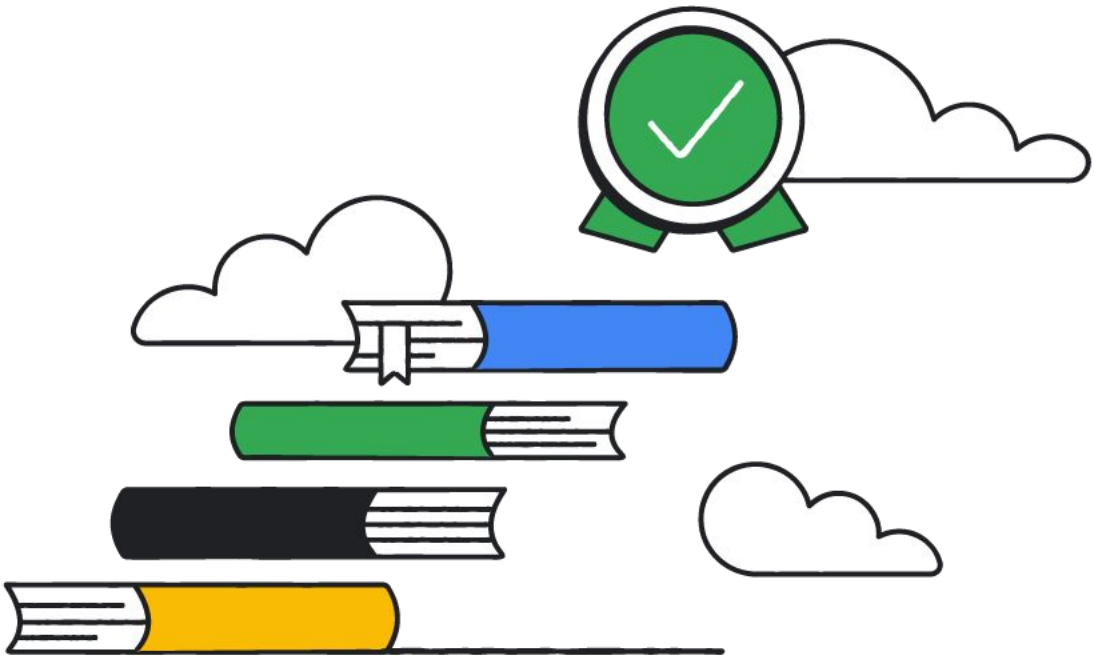
Module 2: Let machines do the work



~ 7 hours to complete

Google Cloud

Google Cloud Skill Badges



Skill Badge

1. Implement Load Balancing on Compute Engine

Skills Badge Overview

Complete the introductory Implement Load Balancing on Compute Engine skill badge* to demonstrate skills in the following: writing gcloud commands and using Cloud Shell, creating and deploying virtual machines in Compute Engine, and configuring network and HTTP load balancers.

Course Outline

Lab 1

- Creating a Virtual Machine: In this hands-on lab, you create VM instances of various machine types using the Google Cloud console and the gcloud command line in Cloud Shell. You also learn how to connect an NGINX web server to your VM.

OR

- Compute Engine: Qwik Start - Windows: In this hands-on lab, you learn how to launch a Windows Server instance in Compute Engine and use Remote Desktop Protocol (RDP) to connect to it.

Lab 2

- Getting Started with Cloud Shell and gcloud: In this hands-on lab, you learn how to connect to computing resources hosted on Google Cloud via Cloud Shell with the gcloud tool.

Lab 3

- Set Up Network and HTTP Load Balancers: In this hands-on lab you learn the differences between a network load balancer and an HTTP load balancer, and how to set them up for your applications running on Compute Engine virtual machines (VMs).

Challenge Lab - Implement Load Balancing on Compute Engine: In a challenge lab you're given a scenario and a set of tasks. You will use the skills learned from the labs in the course to figure out how to complete the tasks on your own!

*A skill badge is an exclusive digital badge issued by Google Cloud in recognition of your proficiency with Google Cloud products and services and tests your ability to apply your knowledge in an interactive hands-on environment. Complete this skill badge, and the final assessment challenge lab, to receive a skill badge that you can share with your network.



~ 3.5 hours to complete

Skill Badge

2. Set Up an App Dev Environment on Google Cloud

Skills Badge Overview

Earn a skill badge* by completing the Set Up an App Dev Environment on Google Cloud course, where you learn how to build and connect storage-centric cloud infrastructure using the basic capabilities of the following technologies: Cloud Storage, Identity and Access Management, Cloud Functions, and Pub/Sub.

Course Outline

Lab 1

- Cloud Storage: Qwik Start - Cloud Console: In this hands-on lab you will learn how to use the Cloud console to create a storage bucket, upload objects to the bucket, create folders and subfolders in the bucket, and make objects in a storage bucket publicly accessible.

  OR

- Cloud Storage: Qwik Start - CLI/SDK: In this hands-on lab you will learn how to create a storage bucket, upload objects to it, create folders and subfolders in it, and make objects publicly accessible using the Google Cloud command line.

Lab 2

- Cloud IAM: Qwik Start: In this lab you'll sign in with 2 different sets of credentials to experience how granting and revoking permissions works from Google Cloud Project Owner and Viewer roles.

Lab 3

- Cloud Monitoring: Qwik Start: In this lab you'll install monitoring and logging agents to collect information from your instance, which could include metrics and logs from 3rd party apps.

Lab 4

- Cloud Functions: Qwik Start - Console: This hands-on lab shows you how to create, deploy, and test a cloud function using the Google Cloud console.

  OR

- Cloud Functions: Qwik Start - Command Line: This hands-on lab shows you how to create, deploy, and test a cloud function using the Google Cloud Shell command line.

Skill Badge

2. Set Up an App Dev Environment on Google Cloud

Lab 5

- Pub/Sub: Qwik Start - Console: In this hands-on lab you will learn how to set up a topic to hold data, subscribe to a topic to access the data and publish and then consume messages with a pull subscriber.

  OR

- Pub/Sub: Qwik Start - Command Line: In this hands-on lab you will learn to create, delete, and list Pub/Sub topics and subscriptions, publish messages to a topic and how to use a pull subscriber.

  OR

- Pub/Sub: Qwik Start - Python: In this lab, you will learn how to get started publishing messages with Pub/Sub using the Python client library.

Challenge Lab - Set Up an App Dev Environment on Google Cloud: In a challenge lab you're given a scenario and a set of tasks. You will use the skills learned from the labs in the course to figure out how to complete the tasks on your own!

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~ 4 hours to complete

Skill Badge

3. Build a Secure Google Cloud Network

Skills Badge Overview

Earn a skill badge by completing the Build and Secure Networks in Google Cloud course, where you will learn about multiple networking-related resources to build, scale, and secure your applications on Google Cloud.

Course Outline

Lab 1

- Securing Virtual Machines using BeyondCorp Enterprise (BCE): In this lab, you will explore how you can use BeyondCorp Enterprise (BCE) and Identity-Aware Proxy (IAP) TCP forwarding to enable administrative access to VM instances that do not have external IP addresses or do not permit direct access over the internet.

Lab 2

- Multiple VPC Networks: In this lab you create several VPC networks and VM instances, then test connectivity across networks.

Lab 3

- VPC Networks - Controlling Access: In this lab, you create two nginx web servers on the default VPC network and control external HTTP access to the web servers using tagged firewall rules. Then, you explore IAM roles and service accounts.

Lab 4

- Application Load Balancer with Cloud Armor: In this lab, you configure an Application Load Balancer with global backends, as shown in the diagram below. Then, you stress test the Load Balancer and denylist the stress test IP with Cloud Armor.

Lab 5

- Create an Internal Load Balancer: In this lab you create two managed instance groups in the same region. Then, you configure and test an Internal Load Balancer with the instances groups as the backends, as shown in the pictured network diagram.

Challenge Lab - Build a Secure Google Cloud Network: In a challenge lab you're given a scenario and a set of tasks. You will use the skills learned from the labs in the course to figure out how to complete the tasks on your own!

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~ 6.5 hours to complete

Skill Badge

4. Prepare Data for ML APIs on Google Cloud

Skills Badge Overview

Complete the Prepare Data for ML APIs on Google Cloud skill badge to demonstrate skills in the following: cleaning data with Dataprep by Trifacta, running data pipelines in Dataflow, creating clusters and running Apache Spark jobs in Dataproc, and calling ML APIs including the Cloud Natural Language API, Google Cloud Speech-to-Text API, and Video Intelligence API.

Course Outline

Lab 1

- Dataprep: Qwik Start: In this lab, you use Dataprep to manipulate a dataset. You import datasets, correct mismatched data, transform data, and join data.

Lab 2

- Dataflow: Qwik Start - Templates: In this lab, you learn how to create a streaming pipeline using one of Google's Dataflow templates.

  OR

- Dataflow: Qwik Start - Python: In this lab, you set up your Python development environment for Dataflow (using the Apache Beam SDK for Python) and run an example Dataflow pipeline.

Lab 3

- Dataproc: Qwik Start - Console: This lab shows you how to use the Google Cloud console to create a Dataproc cluster, run a simple Apache Spark job in the cluster, and then modify the number of workers in the cluster.

  OR

- Dataproc: Qwik Start - Command Line: This lab shows you how to use the command line to create a Dataproc cluster, run a simple Apache Spark job in the cluster, and then modify the number of workers in the cluster.

Lab 4

- Cloud Natural Language API: Qwik Start: In this lab, you learn how to create an API key and use the Cloud Natural Language API to extract "entities" (e.g. people, places, and events) from a snippet of text

Skill Badge

4. Prepare Data for ML APIs on Google Cloud

Lab 5

- Speech-to-Text API: Qwik Start: In this lab, you learn how to create an API key, create a Speech-to-Text API request and call the Speech-to-Text API

Lab 6

- Video Intelligence: Qwik Start: In this lab, you learn how to setup authorization for a custom service account and send an annotate video request to the Video Intelligence API.

Challenge Lab - Prepare Data for ML APIs on Google Cloud: In a challenge lab you're given a scenario and a set of tasks. You will use the skills learned from the labs in the course to figure out how to complete the tasks on your own!

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~ 5 hours to complete



Google Cloud