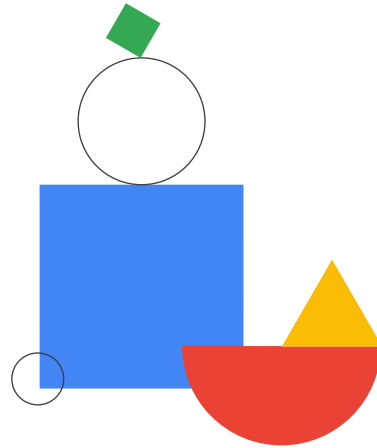


Architecting with Google Cloud: Design and Process



Introductions

Your instructor

- Organization
- Background
- Course goals

You

- Name
- Organization
- Job role
- Course goals



Introductions:

- Your instructor + You
- Background
- Position
- Organization

Learning objectives

- 01 Define application requirements and express as KPIs, SLOs, and SLIs.
- 02 Build microservice applications.
- 03 Choose appropriate Google Cloud storage and deployment services.
- 04 Architect cloud and hybrid networks.
- 05 Secure cloud applications, data, and infrastructure.
- 06 Monitor service levels and costs using Google Cloud tools.



This course is about architecting, design, and process. A cloud architect's job is to determine which cloud services to use in order to most effectively implement the applications and services they are building. This is not an easy job. Many services seem interchangeable. In many cases multiple, different services would work for the same use case. The intent of this course is to simulate the process you can use to design a system that will run on Google Cloud.

You will start by analyzing users and requirements and expressing those requirements as KPIs, SLOs, and SLIs.

With microservices, you divide a program into a set of smaller independent services. You will design a system using this architectural style.

There are many ways to store data and deploy your apps to Google Cloud. You will learn how to make an informed choice about them.

Services have to communicate with one another and with users, legacy applications in your own data centers, and resources in other clouds. You will learn to use Google Cloud networking tools to make this work efficiently and securely.

Speaking of security, you will learn to effectively use Google Cloud security features to keep your data and infrastructure safe.

And you will learn to use the Google Cloud monitoring tools to verify whether your

services are meeting their required goals.

Facilities



Parking



Facilities



Food

Facilities:

- Parking
- Facilities
- Food

Course etiquette



Please silence
your phone and
take calls outside.



Recording
this class
is prohibited.



Ask questions
interactively or
via chat (online).

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- Recording this class is prohibited.
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What's next in the Infrastructure modernization track for Cloud Architects?



Infrastructure modernization

This track is designed for IT professionals who are responsible for implementing, deploying, migrating, and maintaining applications in the cloud.

1

Google Cloud Fundamentals:
Core Infrastructure

2

Architecting with Google
Compute Engine

3

Architecting with Google
Cloud: Design and Process

4

Getting Started with Google
Kubernetes Engine

This **Architecting with Google Cloud: Design and Process** course is part of the Infrastructure modernization learning path. This path is designed for IT professionals who are responsible for designing, developing, and managing robust and scalable cloud architecture solutions.

If you are on this learning path, you would ideally have completed the **Google Cloud Fundamentals: Core Infrastructure** and **Architecting with Google Compute Engine** courses.

This course is not intended to be your first exposure to Google Cloud.

What's next in the Application modernization track for Cloud DevOps Engineers?



Application modernization

This track is designed for application programmers and software engineers who develop software programs in the cloud.

1

Google Cloud Fundamentals:
Core Infrastructure

2

Architecting with Google Cloud:
Design and Process

3

Logging, Monitoring, and
Observability in Google Cloud

This **Architecting with Google Cloud: Design and Process** course is also part of the Application modernization learning path. This path is designed for IT professionals who are responsible for maintaining the efficient operations of the full software delivery pipeline.

If you are on this learning path, you would ideally have completed the **Google Cloud Fundamentals: Core Infrastructure** course.

This course is not intended to be your first exposure to Google Cloud.

Who should attend this course

Target audiences

- Cloud Solutions Architects, Site Reliability Engineers, Systems Operations professionals, DevOps Engineers, IT managers.
- Individuals using Google Cloud to create new solutions or to integrate existing systems, application environments, and infrastructure with Google Cloud.

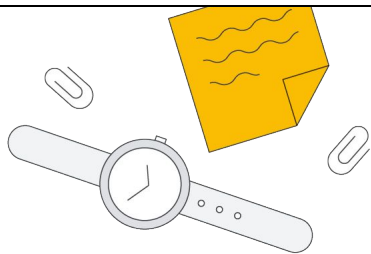
Prerequisites

- Completed Architecting with Google Compute Engine or Architecting with Google Kubernetes Engine or have equivalent experience.
- Basic understanding of designing IT systems.
- Systems Operations experience including deploying and managing applications, either on-premises or in a public cloud environment.

This course is intended for architects, engineers, and other IT professionals who are deploying applications to Google Cloud. Those who are creating new applications on Google Cloud or who are building hybrid applications that integrate with Google Cloud services will benefit from this course.

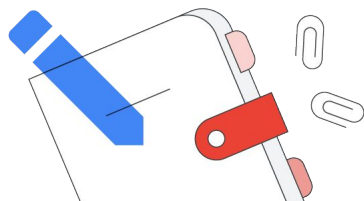
This course assumes that you have attended either the Architecting with Google Compute Engine or the Architecting with Google Kubernetes Engine course or have equivalent experience.

The course also assumes some basic knowledge of application design and some experience deploying and managing systems on-premises or in the cloud.

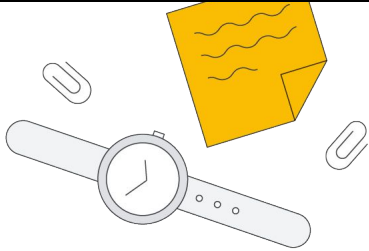


Day 1 agenda

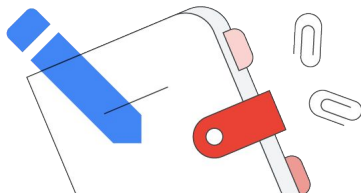
- 01 Defining Services
- 02 Microservice Design and Architecture
- 03 DevOps Automation
- 04 Choosing Storage Solutions



This is a two-day course. On the first day, you will analyze and design a case study application using a microservice architecture. You will also learn Google Cloud tools for DevOps and automation. And you will choose appropriate storage services for your case study.



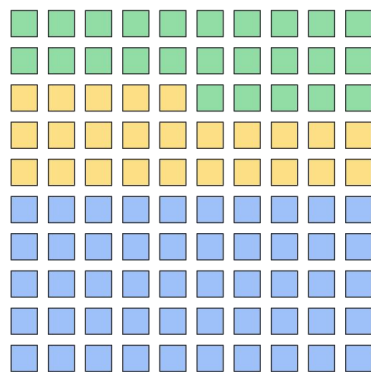
Day 2 agenda



- 05 Google Cloud and Hybrid Network Architecture
- 06 Deploying Applications to Google Cloud
- 07 Designing Reliable Systems
- 08 Security
- 09 Maintenance and Monitoring

On day 2, you learn about network design for cloud and hybrid applications. You will learn to choose the appropriate deployment service. You will also design for reliability and security. Finally, you will learn to monitor your applications.

This course includes...

**25%**

Lecture

25%

Hands-On Labs

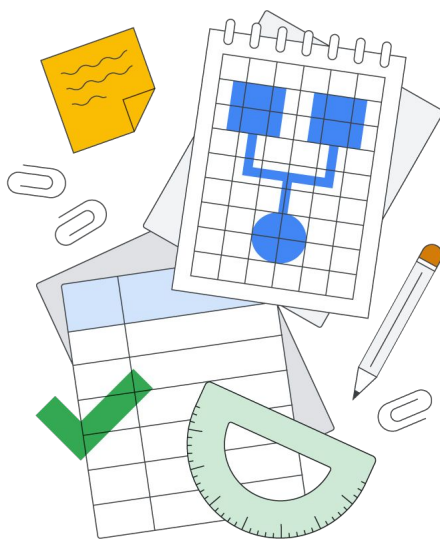
50%

Design Activities 50%

The majority of your time in this course will be spent on design and architectural activities. You will work in groups on a case study to design a cloud-based system. Your group will present its work to the class.

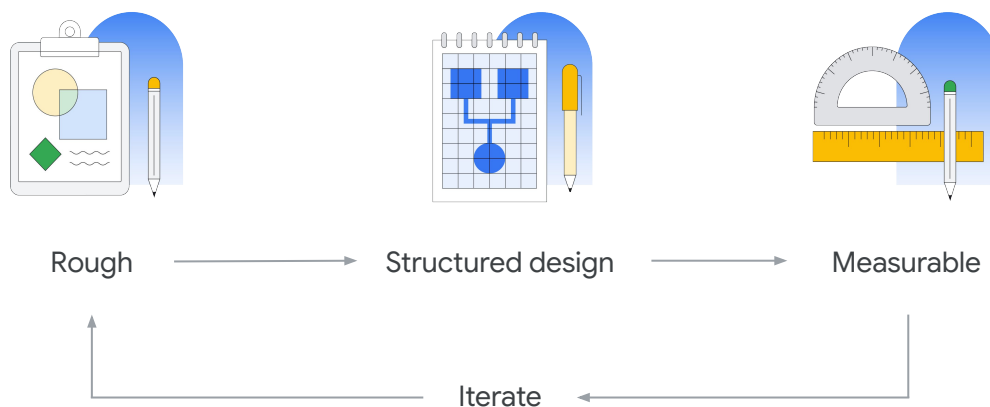
About 25% of this course is instructor-led lecture and discussion. Approximately 50% of this course consists of activities to help you practice your Google Cloud Design and Architecture skills. About 25% of this course is hands-on labs using Qwiklabs.

**This course covers Google
Cloud architecture, design,
and process**



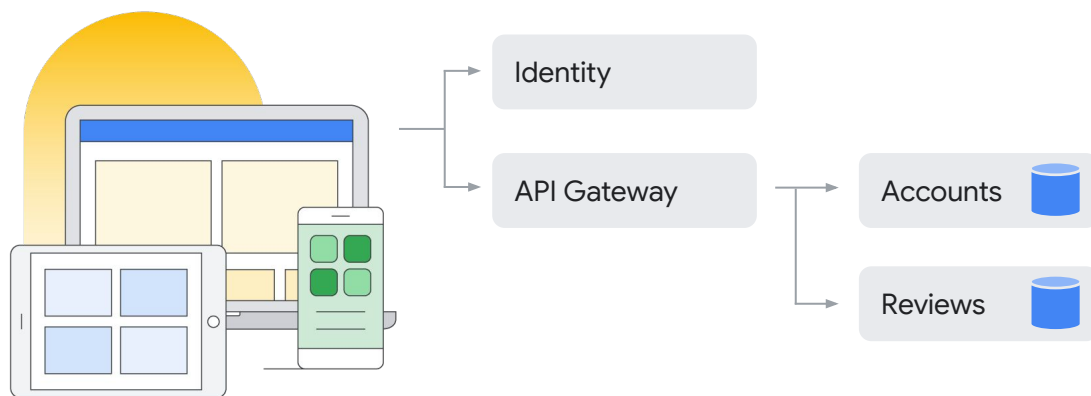
The aim is to build highly reliable and efficient solutions that run on Google Cloud. The course covers using design patterns and the principles of Google Site Reliability Engineering (SRE) effectively.

You will define application requirements



The first step to designing any system is figuring out what the system needs to do, who the users are, and what the system requirements are. You will start here.

Architect your application using microservices



Microservices refers to an architectural style for developing applications. Microservices allow a large application to be decomposed into independent constituent parts, with each part having its own area of responsibility. To serve a single user or API request, a microservices-based application can call many internal microservices to compose its response.

The architecture in the course will be microservice-based. The advantages and disadvantages of this architectural style must be considered. This has a significant effect on the agility of the application in aspects such as development speed, deployment, and monitoring.

Choose the best storage and deployment services using objective criteria



Apigee API
Platform



Google
Kubernetes
Engine



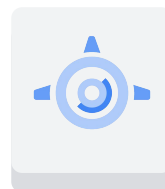
Firestore



Cloud
Endpoints



Cloud Run
functions



App Engine

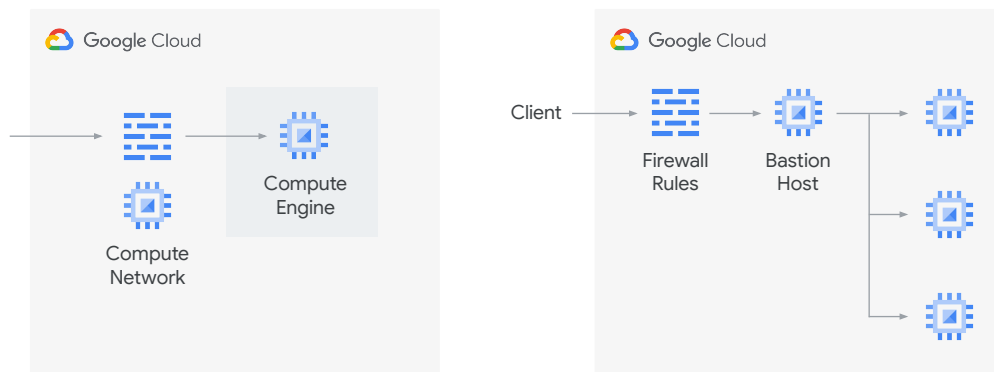
There are many storage services in Google Cloud. Choosing the right ones can be complicated. Do you want a relational database, a NoSQL database, or a data warehouse? Choosing the right storage service is based on many factors. You will learn what those factors are and how to choose the right storage service for your various microservices.

Leverage Google Cloud services for reliability



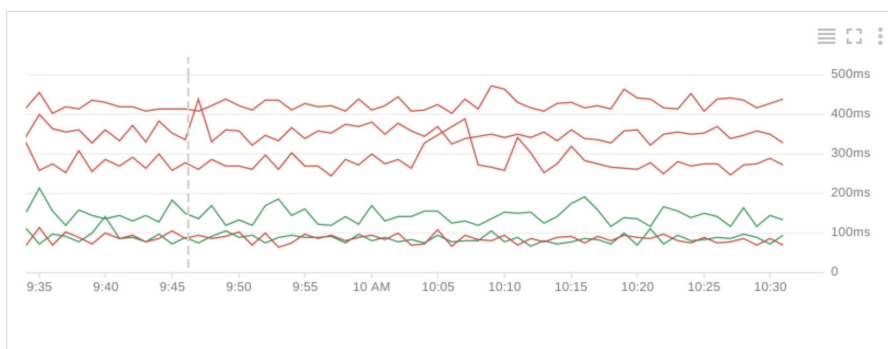
Availability, durability, cost, and disaster recovery are all important considerations when designing systems. If you understand your requirements, you can choose the right Google Cloud services to meet your applications' goals for reliability while optimizing costs.

Of course, you will design with security in mind



There's an old saying: security is not icing on the cake, it is baked into the cake. Before implementing a system on Google Cloud, we should carefully consider its security requirements and use the appropriate security services.

Finally, you will monitor your app to see whether you're meeting your service goals



In Google Cloud there are many services for monitoring your applications. These include dashboards, logs, error reporting, and tracing. You start by defining your application requirements. As you develop your solution, you can use the monitoring tools to determine how successful you are at meeting your application goals.

Activity 1

🕒 20 min

Defining your case study

Your instructor will divide you into groups and give each group access to the Design and Process Workbook. As a group,

- Come up with an interesting case study
- Write a short description
- List some main features
- List user roles



Lab environment

For each lab, Qwiklabs offers:

- A free set of resources for a fixed amount of time
- A clean environment with permissions



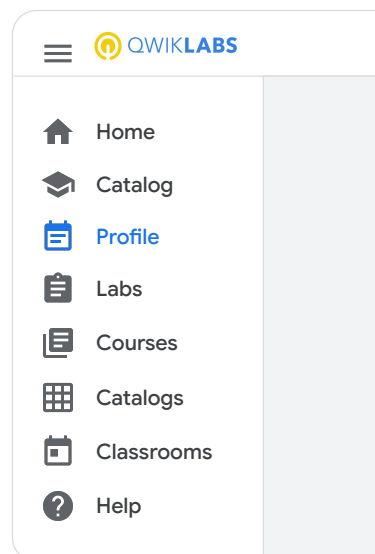
Google Cloud

Qwiklabs provisions you with Google account credentials, so you can access the Google Cloud console for each lab at no cost. Specifically, for each lab, Qwiklabs offers:

- A free set of resources for a fixed amount of time
- A clean environment with permissions

Open Qwiklabs

- 1 Open an incognito window (or private/anonymous window).
- 2 Go to the Qwiklabs URL your instructor provides.
- 3 **Sign In** with existing account or **Join** with new account (with email you used to register for the course).
- 4 Launch the course from **Profile**.



Go ahead and open Qwiklabs:

1. **Open an incognito window** (or private/anonymous window). Use of an incognito browser window reduces the risk that you will accidentally do the labs using your own Google Cloud account instead of Qwiklabs.
2. **Go** to the Qwiklabs URL your instructor provides.
3. **Sign** in with an existing account or **Join** with a new account (with email you used to register for the course).
4. Launch the course from **Profile**.

View your labs

Do **NOT** launch a lab until instructed to do so!

The screenshot shows a user interface with two tabs: 'Labs' (selected) and 'Lecture Notes'. Below the tabs is a list of four lab entries, each represented by a circular icon, a progress bar, and a status label. The first entry has a green checkmark icon and a full progress bar. The second entry has an empty circle icon and a full progress bar. The third and fourth entries have a triangle with an exclamation mark icon and a full progress bar, with a 'Lab Currently Disabled' label to the right of each. To the right of the list, three arrows point to the respective rows with labels: 'Lab completed' for the first row, 'Active lab' for the second row, and 'Not yet available' for the third and fourth rows (indicated by a bracket).

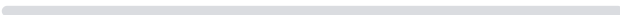







Icon	Progress Bar	Status Label
✓	Full	Lab completed
○	Full	Active lab
⚠	Full	Lab Currently Disabled
⚠	Full	Lab Currently Disabled

After you launch the course, you can view your labs. The lab list will indicate whether a lab is:

- Completed (by you)
- Active
- Not yet available

Your instructor will let you know when it's time to launch a lab. Once you start a lab, you won't be able to pause and restart it, so you'll need a continuous block of time to complete the work.

View lecture notes

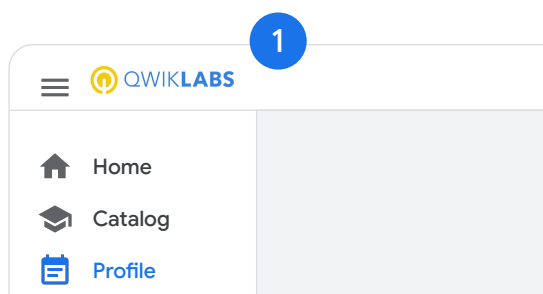
Labs	Lecture Notes
01	 
02	 
03	 
04	 

You can download
these as PDF files

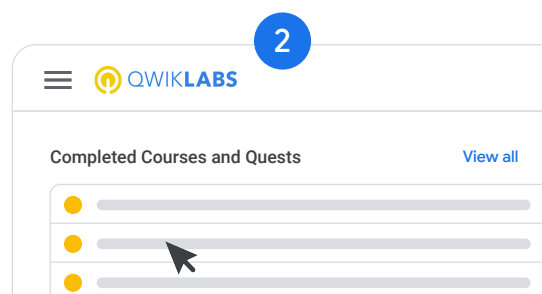
Within the course, you can also view the lecture notes. You can download these as PDF files.

End of class - Materials

Materials are available for 2 years



Click on **Profile** in the left-hand navigation bar



Select the class from the **Completed Courses** list

You can view the course materials within Qwiklabs as follows:

1. Click on **Profile** in the left-hand navigation bar.
2. Select the class from the **Completed Courses** list.

Materials are available for 2 years following the completion of a course.

