

## Developing Applications with Google Cloud

### Overview

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Learn how to design, develop, and deploy applications that seamlessly integrate components from the Google Cloud ecosystem. This course uses lectures, demos, and hands-on labs to show you how to use Google Cloud services and pre-trained machine learning APIs to build secure, scalable, and intelligent cloud-native applications.

### Prerequisite Comments

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Completed Google Cloud Platform Fundamentals or have equivalent experience  
 Working knowledge of Node.js, Python, or Java  
 Basic proficiency with command-line tools and Linux operating system environments

### Target Audience

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Application developers who want to build cloud-native applications or redesign existing applications that will run on Google Cloud Platform

### Course Objectives

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This course teaches participants the following skills:

- Use best practices for application development.
- Choose the appropriate data storage option for application data.
- Implement federated identity management.
- Develop loosely coupled application components or microservices.
- Integrate application components and data sources.
- Debug, trace, and monitor applications.
- Perform repeatable deployments with containers and deployment services.
- Choose the appropriate application runtime environment; use Google Container Engine as a runtime environment and later switch to a no-ops solution with Google App Engine flexible environment.

### Course Outline

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[Register Online](#)

### Schedule

Class Length: 3 Days

G2R = "Guaranteed to Run" | OLL = "Online LIVE"  
 ILT = "Instructor-Led-Training"

06/02/21	8:00AM - 4:00PM	Boise, ID	OLL	€ 1900.00
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## 1 - Best Practices for Application Development

Code and environment management.  
Design and development of secure, scalable, reliable, loosely coupled application components and microservices.  
Continuous integration and delivery.  
Re-architecting applications for the cloud.

## 2 - Google Cloud Client Libraries, Google Cloud SDK, and Google Firebase SDK

How to set up and use Google Cloud Client Libraries, Google Cloud SDK, and Google Firebase SDK.  
Lab: Set up Google Client Libraries, Cloud SDK, and Firebase SDK on a Linux instance and set up application credentials.

## 3 - Overview of Data Storage Options

Overview of options to store application data.  
Use cases for Google Cloud Storage, Cloud Firestore, Cloud Bigtable, Google Cloud SQL, and Cloud Spanner.

## 4 - Best Practices for Using Cloud Firestore

Best practices related to using Cloud Firestore in Datastore mode for: Queries, Built-in and composite indexes, Inserting and deleting data (batch operations), Transactions, Error handling.  
Bulk-loading data into Cloud Firestore by using Google Cloud Dataflow.  
Lab: Store application data in Cloud Datastore.

## 5 - Performing Operations on Cloud Storage

Operations that can be performed on buckets and objects.  
Consistency model.  
Error handling.

## 6 - Best Practices for Using Cloud Storage

Naming buckets for static websites and other uses.  
Naming objects (from an access distribution perspective).  
Performance considerations.  
Setting up and debugging a CORS configuration on a bucket.  
Lab: Store files in Cloud Storage.

## 7 - Handling Authentication and Authorization

Cloud Identity and Access Management (IAM) roles and service accounts.  
User authentication by using Firebase Authentication.  
User authentication and authorization by using Cloud Identity-Aware Proxy.  
Lab: Authenticate users by using Firebase Authentication.

## 8 - Using Pub/Sub to Integrate Components of Your Application

Topics, publishers, and subscribers.  
Pull and push subscriptions.  
Use cases for Cloud Pub/Sub.  
Lab: Develop a backend service to process messages in a message queue.

## 9 - Adding Intelligence to Your Application

Overview of pre-trained machine learning APIs such as Cloud Vision API and Cloud Natural Language Processing API.

## 10 - Using Cloud Functions for Event-Driven Processing

Key concepts such as triggers, background functions, HTTP functions.  
Use cases.  
Developing and deploying functions.  
Logging, error reporting, and monitoring.

## 11 - Managing APIs with Cloud Endpoints

Open API deployment configuration.  
Lab: Deploy an API for your application.

## 12 - Deploying Applications

Creating and storing container images.  
Repeatable deployments with deployment configuration and templates.  
Lab: Use Deployment Manager to deploy a web application into Google App Engine flexible environment test and production environments.

## 13 - Execution Environments for Your Application

Considerations for choosing an execution environment for your application or service: Google Compute Engine (GCE), Google Kubernetes Engine (GKE), App Engine flexible environment, Cloud Functions, Cloud Dataflow, Cloud Run.  
Lab: Deploying your application on App Engine flexible environment.

## 14 - Debugging, Monitoring, and Tuning Performance

Application Performance Management Tools.

Stackdriver Debugger.

Stackdriver Error Reporting.

Lab: Debugging an application error by using Stackdriver Debugger and Error Reporting.

Stackdriver Logging.

Key concepts related to Stackdriver Trace and Stackdriver Monitoring.

Lab: Use Stackdriver Monitoring and Stackdriver Trace to trace a request across services, observe, and optimize performance.

## Related Courses, Certifications, Exams ---

- Google Cloud Fundamentals - Core Infrastructure
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