

# Sela.

GCPDataEng

## Data Engineering on Google Cloud

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# Data Engineering on Google Cloud

GCPDataEng - Version: 1

 4 days Course

## Description:

This course provides participants a hands-on introduction to designing and building data processing systems on Google Cloud Platform. Participants will learn how to design data processing systems, build end-to-end data pipelines, analyze data and carry out machine learning. The course covers structured, unstructured, and streaming data.

## Intended audience:

Extracting, Loading, Transforming, cleaning, and validating data  
Designing pipelines and architectures for data processing  
Creating and maintaining machine learning and statistical models  
Querying datasets, visualizing query results and creating reports

## Prerequisites:

Completed Google Cloud Fundamentals: Big Data & Machine Learning course OR  
have equivalent experience  
Basic proficiency with common query language such as SQL  
Experience with data modeling, extract, transform, load activities  
Developing applications using a common programming language such as Python  
Familiarity with Machine Learning and/or statistics

## Objectives:

Design and build data processing systems on Google Cloud Platform



Process batch and streaming data by implementing autoscaling data pipelines on Cloud Dataflow

Derive business insights from extremely large datasets using Google BigQuery

Train, evaluate and predict using machine learning models using Tensorflow and Cloud ML

Leverage unstructured data using Spark and ML APIs on Cloud Dataproc

Enable instant insights from streaming data

## Topics:

### Module 1: Google Cloud Dataproc Overview

- Creating and managing clusters.
- Leveraging custom machine types and preemptible worker nodes.
- Scaling and deleting Clusters.

### Module 2: Running Dataproc Jobs

- Running Pig and Hive jobs.
- Separation of storage and compute.

### Module 3: Integrating Dataproc with Google Cloud Platform

- Customize cluster with initialization actions.
- BigQuery Support.

### Module 4: Making Sense of Unstructured Data with Google's Machine

- Google's Machine Learning APIs.
- Common ML Use Cases.



- Invoking ML APIs.

## Module 5: Serverless data analysis with BigQuery

- What is BigQuery.
- Queries and Functions.
- Lab: Writing queries in BigQuery.
- Loading data into BigQuery.
- Exporting data from BigQuery.
- Nested and repeated fields.
- Querying multiple tables.
- Performance and pricing.

## Module 6: Serverless, autoscaling data pipelines with Dataflow

- The Beam programming model.
- Data pipelines in Beam Python.
- Data pipelines in Beam Java.
- Scalable Big Data processing using Beam.
- Incorporating additional data.
- Handling stream data.
- GCP Reference architecture.

## Module 7: Getting started with Machine Learning

- What is machine learning (ML).
- Effective ML: concepts, types.
- ML datasets: generalization.

## Module 8: Building ML models with Tensorflow



- Getting started with TensorFlow.
- TensorFlow graphs and loops + lab.
- Monitoring ML training.

## Module 9: Scaling ML models with CloudML

- Why Cloud ML?
- Packaging up a TensorFlow model.
- End-to-end training.

## Module 10: Feature Engineering

- Creating good features.
- Transforming inputs.
- Synthetic features.
- Preprocessing with Cloud ML.

## Module 11: Architecture of streaming analytics pipelines

- Stream data processing: Challenges.
- Handling variable data volumes.
- Dealing with unordered/late data.

## Module 12: Ingesting Variable Volumes

- What is Cloud Pub/Sub?
- How it works: Topics and Subscriptions.

## Module 13: Implementing streaming pipelines



- Challenges in stream processing.
- Handle late data: watermarks, triggers, accumulation.

## Module 14: Streaming analytics and dashboards

- Streaming analytics: from data to decisions.
- Querying streaming data with BigQuery.
- What is Google Data Studio?

## Module 15: High throughput and low-latency with Bigtable

- What is Cloud Spanner?
- Designing Bigtable schema.
- Ingesting into Bigtable.