



Introduction to AI and Machine Learning on Google Cloud

Course description

In this course, you will learn about the fundamental concepts of Artificial Intelligence (AI) and Machine Learning (ML), and how Google Cloud Platform (GCP) provides a comprehensive suite of tools and services to implement them. You will gain a solid understanding of key AI/ML concepts, explore various GCP services designed for different stages of the ML lifecycle, and learn best practices for building, deploying, and managing intelligent applications. By the end of the course, you will be equipped to identify appropriate AI/ML solutions on Google Cloud for various business challenges and understand the basics of implementing them responsibly.

- Course level: Fundamental
- Duration: 2 days

Activities

This course includes presentations, hands-on labs, demonstrations, and group exercises.

Course objectives

In this course, you will learn to:

- Summarize core concepts of Artificial Intelligence and Machine Learning

- Identify and describe the key AI/ML services available on Google Cloud Platform
- Understand the typical Machine Learning workflow and how GCP services map to each stage
- Explain how to prepare, process, and store data for ML models on Google Cloud
- Discuss the principles of responsible AI and their application on Google Cloud
- Implement basic machine learning models using Google Cloud's Vertex AI platform
- Recognize suitable use cases for Google Cloud's pre-trained AI APIs
- Plan the initial steps for integrating AI/ML solutions into your organization using GCP

Intended audience

This course is intended for those with limited prior knowledge of AI/ML or Google Cloud:

- Developers
- Data analysts
- Aspiring data scientists
- Solution architects
- IT managers
- Business intelligence professionals
- Project managers exploring AI/ML capabilities

Prerequisites

We recommend that attendees of this course have:

- Basic understanding of cloud computing concepts
- Familiarity with a programming language (e.g., Python) is helpful but not strictly required for all modules

Course outline

Module 1: Introduction to AI, ML, and Google Cloud

- What is AI and Machine Learning?
- Types of ML: Supervised, Unsupervised, Reinforcement Learning
- Why Google Cloud for AI/ML?

- Overview of the Google Cloud ecosystem for ML
- Demo: Navigating the Google Cloud Console for ML resources

Module 2: Understanding the Machine Learning Workflow on GCP

- Data ingestion and storage options (Cloud Storage, BigQuery)
- Data preparation and feature engineering
- Model training and evaluation
- Model deployment and monitoring
- Iteration and MLOps principles
- Hands-on Lab: Exploring data in BigQuery for ML

Module 3: Google Cloud AI/ML Services Overview

- Introduction to Vertex AI: The unified ML platform
- Pre-trained APIs: Vision AI, Natural Language AI, Speech-to-Text, Translation AI
- Custom ML training services (Vertex AI Workbench, Training)
- AutoML: ML without code
- Vertex AI MLOps tools (Pipelines, Feature Store, Model Monitoring)
- Demo: Quick tour of Vertex AI services

Module 4: Data Preparation and Feature Engineering on Google Cloud

- Data storage options for ML (Cloud Storage, BigQuery, Cloud SQL)
- Data ingestion strategies (batch vs. streaming)
- Data cleaning and transformation using Dataflow and Dataproc
- Feature engineering best practices for ML
- Understanding BigQuery ML for in-database ML
- Hands-on Lab: Data preprocessing with Dataflow on a sample dataset

Module 5: Building and Training Custom ML Models with Vertex AI

- Introduction to Vertex AI Workbench for experimentation
- Training custom models using Vertex AI Training
- Choosing the right machine type and accelerator
- Hyperparameter tuning with Vertex AI Vizier
- Model evaluation and metrics
- Hands-on Lab: Training a custom classification model using Vertex AI Training

Module 6: Deploying and Managing ML Models on Google Cloud

- Deploying models to Vertex AI Endpoints
- Online prediction vs. batch prediction
- Monitoring model performance and drift
- Model versioning and lifecycle management
- A/B testing deployed models
- Demo: Deploying and querying a simple model endpoint

Module 7: Exploring Google Cloud's Pre-trained AI APIs

- Vision AI: Image classification, object detection, OCR
- Natural Language AI: Sentiment analysis, entity extraction, content classification
- Speech-to-Text and Text-to-Speech: Voice interaction
- Translation AI: Multilingual capabilities
- Use cases and benefits of pre-trained APIs
- Hands-on Lab: Using the Vision AI API for image analysis

Module 8: Responsible AI Principles and Considerations on Google Cloud

- Introduction to Responsible AI
- Core principles: Fairness, privacy, safety, transparency
- Mitigating bias in ML models
- Data governance and compliance for AI/ML
- Vertex AI Explainable AI: Understanding model predictions
- Demo: Interpreting model predictions with Explainable AI

Module 9: Integrating AI/ML into Applications and Business

- Identifying suitable AI/ML use cases for your organization
- Designing an AI-powered application architecture on GCP
- Cost considerations for AI/ML services
- Best practices for adopting AI/ML
- Hands-on Lab: Capstone - Proposing an AI/ML solution for a given business problem

Module 10: Course Wrap-up

- Next steps and additional resources
- Google Cloud certifications for AI/ML
- Course summary and Q&A

Your course overview ends here.
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About CloudThat

Established in 2012, CloudThat is an award-winning company and the first in India to offer cloud training and consulting services for individuals and enterprises worldwide. Recently, it won Google Cloud's New Training Partner of the Year Award for 2025, becoming the first company in the world in 2025 to hold awards from all three major cloud giants: AWS, Microsoft, and Google. CloudThat notably won consecutive AWS Training Partner of the Year (APJ) awards in 2023 and 2024 and the Microsoft Training Services Partner of the Year Award in 2024, bringing its total award count to an impressive 12 awards in the last 8 years.

CloudThat specializes in Cloud Migration, Data Platforms, DevOps, IoT, and cutting-edge technologies like Gen AI & AI/ML. As a Microsoft Solutions Partner, AWS Premier Tier Training Partner, Google Cloud Platform Partner, and collaborator with leading organizations like HPE, Oracle, Nvidia and Databricks, CloudThat has trained over 850,000 professionals across 600+ cloud certifications, empowering students and professionals worldwide to advance their skills and careers.

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