Introduction to AI and machine learning on Google Cloud Training

Duration: **1 Day**

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Introduction to AI and Machine Learning on Google Cloud is a foundational training program designed for professionals who want to build artificial intelligence and machine learning solutions using Google Cloud technologies. The course introduces the complete **Data-to-AI Lifecycle**, helping learners understand how Google Cloud supports AI foundations, model development, deployment, and generative AI solutions.

Throughout the training, participants explore powerful Google Cloud services including**Vertex AI**, **BigQuery ML**, **AutoML**, **Generative AI Studio**, **Model Garden**, and various pre-trained AI APIs. The course demonstrates how to build, train, deploy, and manage machine learning models while leveraging Google's advanced AI infrastructure.

This program is ideal for professionals seeking practical knowledge of Google Cloud's AI ecosystem and provides a strong foundation for developing scalable, production-ready machine learning and generative AI solutions.

Prerequisites

To gain maximum benefit from this course, participants should have:

- Basic understanding of **Machine Learning** concepts
- Familiarity with SQL
- Basic Python programming knowledge
- General awareness of cloud computing concepts (recommended)

Who Should Attend

This course is ideal for:

- **AI Developers**
- **Machine Learning Engineers**
- **Data Scientists**
- **Data Engineers**
- Cloud professionals
- Software developers building AI applications
- Professionals interested in Google Cloud AI solutions

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What You Will Learn

By the end of this course, learners will be able to:

- Identify Google Cloud's key **AI and ML services**.
- Understand the complete Data-to-AI lifecycle.
- Select the most appropriate AI development approach.
- Build machine learning models using **Vertex AI**.
- Create models directly in data warehouses using **BigQuery ML**.
- Develop ML solutions with **AutoML**.
- Integrate pre-trained AI APIs into applications.
- Build generative AI solutions using Google Cloud tools.
- Understand MLOps practices and workflow automation.

Training Outline

AI Foundations

Google Cloud AI Ecosystem

- Introduction to Google Cloud
- Google's AI strategy and innovation
- Cloud-based AI solutions
- Data-driven AI approaches

AI/ML Framework on Google Cloud

- Google Cloud AI architecture
- Data and AI services
- Machine learning lifecycle
- Google Cloud AI platforms

Google Cloud Infrastructure

- Cloud infrastructure fundamentals
- Scalable AI environments
- Security and performance considerations

Data and AI Products

- Google Cloud data services
- AI and analytics tools
- Integrated data management solutions

ML Model Categories

- Supervised learning
- Unsupervised learning
- Deep learning

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- Predictive modeling approaches

BigQuery ML

- **BigQuery ML**
- SQL-based machine learning
- Building models directly in BigQuery
- Analytics and prediction use cases

AI Development Options

AI Development Approaches

- Types of AI projects
- Development strategies
- Solution selection considerations

Pre-trained APIs

- Pre-trained AI services
- Vision APIs
- Natural Language Processing APIs
- Speech and translation services

Vertex AI

- **Vertex AI**
- End-to-end AI platform
- Model training and deployment
- Enterprise AI development workflows

AutoML

- **AutoML**
- No-code machine learning
- Automated model building
- Training optimization

Custom Training

- Custom model development
- Advanced training techniques
- Specialized ML use cases

AI Development Workflow

How Machine Learning Works

- Machine learning fundamentals
- Learning mechanisms
- Data and algorithm relationships

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ML Workflow

- Problem definition
- Data preparation
- Model development
- Evaluation processes
- Production deployment

Data Preparation

- Data collection
- Data cleaning
- Data transformation
- Feature engineering

Model Development

- Model selection
- Training methodologies
- Performance optimization

Model Serving

- Model deployment
- API integration
- Real-time inference

MLOps and Workflow Automation

- **MLOps**
- Continuous integration
- Continuous deployment
- Model lifecycle management

Generative AI

Generative AI Fundamentals

- **Generative AI**
- Large Language Models (LLMs)
- Foundation Models
- Prompt Engineering

Duet AI Use Cases

- **Duet AI**
- AI-assisted productivity solutions
- Intelligent workflow automation

Model Garden

- **Model Garden**

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- Pre-built AI models
- Foundation model access
- Model selection strategies

Generative AI Studio

- **Generative AI Studio**
- Prompt development
- Model testing environments
- Generative AI application development

AI Solutions

- Enterprise AI solutions
- Conversational AI
- Content generation
- Intelligent automation systems

Hands-On Labs

BigQuery ML Lab

- Building ML models with SQL
- Data analytics exercises

Natural Language API Lab

- NLP service implementation
- Text analytics applications

AutoML Lab

- No-code model development
- Training and evaluation workflows

Generative AI Studio Lab

- Prompt engineering exercises
- Generative AI solution development