

# MLOps (Machine Learning Operations) Fundamentals

## Course Contents

The Modules covered in this course are as follows:

### **Module 1: Why and When do we need MLOps**

- Discuss Data Scientists' pain points.
- Identify ML Engineering characteristics and challenges.
- Define how Google Cloud can help with MLOps.
- Recognize how MLOps differs from manual ML management.
- Compare and contrast DevOps vs MLOps.

### **Module 2: Understanding the Main Kubernetes Components (Optional)**

- Define what is a Docker container.
- Create Docker containers.
- Identify the architecture of Kubernetes: pods, namespaces.
- Create Docker containers using Google Container Builder.
- Store container images in Google Container Registry.
- Create a Kubernetes Engine cluster.
- Manage Kubernetes deployments.

### **Module 3: Introduction to AI Platform Pipelines**

- Identify the benefits and opportunities of AI Pipelines.
- Define Access Controls within AI Pipelines.
- Recognize pipeline components.
- List pipeline workflows.
- Set up AI Platform Pipelines.
- Create a machine learning pipeline.
- Run a machine learning pipeline.
- Connect to AI Platform Pipelines using the Kubeflow Pipelines SDK.
- Configure a Google Kubernetes Engine cluster for AI Platform Pipelines.

#### **Module 4: Training, Tuning and Serving on AI Platform**

- Identify the main concepts of MLOps on AI Platform.
- Create a reproducible dataset.
- Implement a tunable model.
- Build and push a training container.
- Train and tune a model.
- Serve and query a model.

#### **Module 5: Kubeflow Pipelines on AI Platform**

- Recognize how Kubeflow Pipelines fits in MLOps.
- Describe a Kubeflow Pipeline with KF DSL.
- Use the various Kubeflow components.
- Compile, upload, and run a pipeline build in Kubeflow Pipelines.

#### **Module 6: CI/CD for Kubeflow Pipelines on AI Platform**

- Create Cloud Build Builders.
- Configure pipelines with Cloud Build.
- Create triggers for training models using Cloud Build Triggers.
- Adopt the best CI/CD practices in the context of ML systems.

#### **Module 7: Summary**

- Summarize the course.