

# Machine Learning on Google Cloud

## *Module 1: How Google Does Machine Learning*

- Develop a data strategy around machine learning.
- Examine use cases that are then reimagined through an ML lens.
- Recognize biases that ML can amplify.
- Leverage Google Cloud Platform tools and environment to do ML.
- Learn from Google's experience to avoid common pitfalls.
- Carry out data science tasks in online collaborative notebooks.
- Invoke pre-trained ML models from Cloud AI Platform.

## *Module 2: Launching into Machine Learning*

- Describe how to improve data quality.
- Perform exploratory data analysis.
- Build and train supervised learning models.
- Optimize and evaluate models using loss functions and performance metrics.
- Mitigate common problems that arise in machine learning.
- Create repeatable and scalable training, evaluation, and test datasets.

## *Module 3: Introduction to TensorFlow 2.x*

- Create TensorFlow 2.x and Keras machine learning models.
- Describe Tensorflow 2.x key components.
- Use the tf.data library to manipulate data and large datasets.
- Use the Keras Sequential and Functional APIs for simple and advanced model creation.
- Train, deploy, and productionalize ML models at scale with Cloud AI Platform.

## *Module 4: Feature Engineering*

- Compare the key required aspects of a good feature.
- Combine and create new feature combinations through feature crosses.
- Perform feature engineering using BQML, Keras, and TensorFlow 2.x.
- Understand how to preprocess and explore features with Cloud Dataflow and Cloud Dataprep.
- Understand and apply how TensorFlow transforms features.

## *Module 5: Art and Science of Machine Learning*

- Optimize model performance with hyperparameter tuning.
- Experiment with neural networks and fine-tune performance.
- Enhance ML model features with embedding layers.