uCertify

Course Outline

Google Cloud Certified Professional Machine Learning Engineer

04 Aug 2025

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1. Course Objective

The Google Cloud Professional Machine Learning Engineer course equips you with the skills to design, build, and deploy sophisticated machine learning models on Google Cloud. You'll dive deep into key topics like framing ML problems, architecting scalable ML solutions, developing and optimizing models, automating end-to-end ML pipelines, and monitoring model performance. This course is ideal for experienced Google Cloud users who want to take their machine-learning skills to the next level.

2. Pre-Assessment

Pre-Assessment lets you identify the areas for improvement before you start your prep. It determines what students know about a topic before it is taught and identifies areas for improvement with question assessment before beginning the course.

3. Exercises

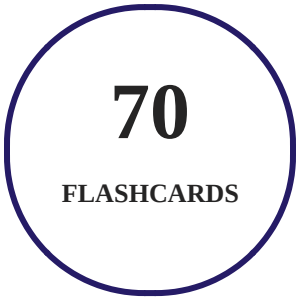
There is no limit to the number of times learners can attempt these. Exercises come with detailed remediation, which ensures that learners are confident on the topic before proceeding.

4. Quiz

Quizzes test your knowledge on the topics of the exam when you go through the course material. There is no limit to the number of times you can attempt it.

5. flashcards

Flashcards are effective memory-aiding tools that help you learn complex topics easily. The flashcard will help you in memorizing definitions, terminologies, key concepts, and more. There is no limit to the number of times learners can attempt these. Flashcards help master the key concepts.



6. Glossary of terms

uCertify provides detailed explanations of concepts relevant to the course through Glossary. It contains a list of frequently used terminologies along with its detailed explanation. Glossary defines the key terms.

7. Expert Instructor-Led Training

uCertify uses the content from the finest publishers and only the IT industry's finest instructors. They have a minimum of 15 years real-world experience and are subject matter experts in their fields. Unlike a live class, you can study at your own pace. This creates a personal learning experience and gives you all the benefit of hands-on training with the flexibility of doing it around your schedule 24/7.

8. ADA Compliant & JAWS Compatible Platform

uCertify course and labs are ADA (Americans with Disability Act) compliant. It is now more accessible to students with features such as:

- Change the font, size, and color of the content of the course
- Text-to-speech, reads the text into spoken words
- Interactive videos, how-tos videos come with transcripts and voice-over
- Interactive transcripts, each word is clickable. Students can clip a specific part of the video by clicking on a word or a portion of the text.

JAWS (Job Access with Speech) is a computer screen reader program for Microsoft Windows that reads the screen either with a text-to-speech output or by a Refreshable Braille display. Student can easily navigate uCertify course using JAWS shortcut keys.

9. State of the Art Educator Tools

uCertify knows the importance of instructors and provide tools to help them do their job effectively. Instructors are able to clone and customize course. Do ability grouping. Create sections. Design grade scale and grade formula. Create and schedule assessments. Educators can also move a student from self-paced to mentor-guided to instructor-led mode in three clicks.

10. Award Winning Learning Platform (LMS)

uCertify has developed an award winning, highly interactive yet simple to use platform. The SIIA CODiE Awards is the only peer-reviewed program to showcase business and education technology's finest products and services. Since 1986, thousands of products, services and solutions have been

recognized for achieving excellence. uCertify has won CODiE awards consecutively for last 7 years:

- **2014**
    1. Best Postsecondary Learning Solution

- **2015**
    1. Best Education Solution
    2. Best Virtual Learning Solution
    3. Best Student Assessment Solution
    4. Best Postsecondary Learning Solution
    5. Best Career and Workforce Readiness Solution
    6. Best Instructional Solution in Other Curriculum Areas
    7. Best Corporate Learning/Workforce Development Solution

- **2016**
    1. Best Virtual Learning Solution
    2. Best Education Cloud-based Solution
    3. Best College and Career Readiness Solution
    4. Best Corporate / Workforce Learning Solution
    5. Best Postsecondary Learning Content Solution
    6. Best Postsecondary LMS or Learning Platform
    7. Best Learning Relationship Management Solution

- **2017**
    1. Best Overall Education Solution
    2. Best Student Assessment Solution
    3. Best Corporate/Workforce Learning Solution
    4. Best Higher Education LMS or Learning Platform

- **2018**
    1. Best Higher Education LMS or Learning Platform

2. Best Instructional Solution in Other Curriculum Areas
3. Best Learning Relationship Management Solution

- **2019**
  1. Best Virtual Learning Solution
  2. Best Content Authoring Development or Curation Solution
  3. Best Higher Education Learning Management Solution (LMS)

- **2020**
  1. Best College and Career Readiness Solution
  2. Best Cross-Curricular Solution
  3. Best Virtual Learning Solution

11. Chapter & Lessons

uCertify brings these textbooks to life. It is full of interactive activities that keeps the learner engaged. uCertify brings all available learning resources for a topic in one place so that the learner can efficiently learn without going to multiple places. Challenge questions are also embedded in the chapters so learners can attempt those while they are learning about that particular topic. This helps them grasp the concepts better because they can go over it again right away which improves learning.

Learners can do Flashcards, Exercises, Quizzes and Labs related to each chapter. At the end of every lesson, uCertify courses guide the learners on the path they should follow.

Syllabus

Chapter 1: Introduction

- Google Cloud Professional Machine Learning Engineer Certification
- Who Should Buy This Course
- How This Course Is Organized

- Conventions Used in This Course
- Google Cloud Professional ML Engineer Objective Map

Chapter 2: Framing ML Problems

- Translating Business Use Cases
- Machine Learning Approaches
- ML Success Metrics
- Responsible AI Practices
- Summary
- Exam Essentials

Chapter 3: Exploring Data and Building Data Pipelines

- Visualization
- Statistics Fundamentals
- Data Quality and Reliability
- Establishing Data Constraints
- Running TFDV on Google Cloud Platform
- Organizing and Optimizing Training Datasets

- Handling Missing Data
- Data Leakage
- Summary
- Exam Essentials

Chapter 4: Feature Engineering

- Consistent Data Preprocessing
- Encoding Structured Data Types
- Class Imbalance
- Feature Crosses
- TensorFlow Transform
- GCP Data and ETL Tools
- Summary
- Exam Essentials

Chapter 5: Choosing the Right ML Infrastructure

- Pretrained vs. AutoML vs. Custom Models
- Pretrained Models
- AutoML

- Custom Training
- Provisioning for Predictions
- Summary
- Exam Essentials

Chapter 6: Architecting ML Solutions

- Designing Reliable, Scalable, and Highly Available ML Solutions
- Choosing an Appropriate ML Service
- Data Collection and Data Management
- Automation and Orchestration
- Serving
- Summary
- Exam Essentials

Chapter 7: Building Secure ML Pipelines

- Building Secure ML Systems
- Identity and Access Management
- Privacy Implications of Data Usage and Collection

- Summary
- Exam Essentials

Chapter 8: Model Building

- Choice of Framework and Model Parallelism
- Modeling Techniques
- Transfer Learning
- Semi?supervised Learning
- Data Augmentation
- Model Generalization and Strategies to Handle Overfitting and Underfitting
- Summary
- Exam Essentials

Chapter 9: Model Training and Hyperparameter Tuning

- Ingestion of Various File Types into Training
- Developing Models in Vertex AI Workbench by Using Common Frameworks
- Training a Model as a Job in Different Environments
- Hyperparameter Tuning
- Tracking Metrics During Training

- Retraining/Redeployment Evaluation
- Unit Testing for Model Training and Serving
- Summary
- Exam Essentials

Chapter 10: Model Explainability on Vertex AI

- Model Explainability on Vertex AI
- Summary
- Exam Essentials

Chapter 11: Scaling Models in Production

- Scaling Prediction Service
- Serving (Online, Batch, and Caching)
- Google Cloud Serving Options
- Hosting Third?Party Pipelines (MLflow) on Google Cloud
- Testing for Target Performance
- Configuring Triggers and Pipeline Schedules
- Summary

- Exam Essentials

Chapter 12: Designing ML Training Pipelines

- Orchestration Frameworks
- Identification of Components, Parameters, Triggers, and Compute Needs
- System Design with Kubeflow/TFX
- Hybrid or Multicloud Strategies
- Summary
- Exam Essentials

Chapter 13: Model Monitoring, Tracking, and Auditing Metadata

- Model Monitoring
- Model Monitoring on Vertex AI
- Logging Strategy
- Model and Dataset Lineage
- Vertex AI Experiments
- Vertex AI Debugging
- Summary
- Exam Essentials

Chapter 14: Maintaining ML Solutions

- MLOps Maturity
- Retraining and Versioning Models
- Feature Store
- Vertex AI Permissions Model
- Common Training and Serving Errors
- Summary
- Exam Essentials

Chapter 15: BigQuery ML

- BigQuery – Data Access
- BigQuery ML Algorithms
- Explainability in BigQuery ML
- BigQuery ML vs. Vertex AI Tables
- Interoperability with Vertex AI
- BigQuery Design Patterns
- Summary

- Exam Essentials

12. Practice Test

Here's what you get

60	2	65
PRE-ASSESSMENTS QUESTIONS	FULL LENGTH TESTS	POST-ASSESSMENTS QUESTIONS

Features

Each question comes with detailed remediation explaining not only why an answer option is correct but also why it is incorrect.

Unlimited Practice

Each test can be taken unlimited number of times until the learner feels they are prepared. Learner can review the test and read detailed remediation. Detailed test history is also available.

Each test set comes with learn, test and review modes. In learn mode, learners will attempt a question and will get immediate feedback and complete remediation as they move on to the next question. In test mode, learners can take a timed test simulating the actual exam conditions. In review mode, learners can read through one item at a time without attempting it.

13. Live Labs

The benefits of live-labs are:

- Exam based practical tasks
- Real equipment, absolutely no simulations
- Access to the latest industry technologies
- Available anytime, anywhere on any device
- Break and Reset functionality
- No hardware costs

Lab Tasks

Exploring Data and Building Data Pipelines

- Splitting Data
- Transforming Categorical Data into Numerical Data

Feature Engineering

- Performing EDA
- Using Tensorflow Transform

Choosing the Right ML Infrastructure

- Using Natural Language AI

Architecting ML Solutions

- Storing Data in BigQuery

Building Secure ML Pipelines

- Creating a Workbench Instance

Model Building

- Building a DNN
- Building an ANN Model

Maintaining ML Solutions

- Using TensorFlow Data Validation (TFDV)

BigQuery ML

- Creating a Model in BigQuery

Here's what you get

11	11	24
LIVE LABS	VIDEO TUTORIALS	MINUTES

14. Post-Assessment

After completion of the uCertify course Post-Assessments are given to students and often used in conjunction with a Pre-Assessment to measure their achievement and the effectiveness of the exam.