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Sign Up

Microsoft Machine Learning Operations Engineer Training

Preparation for the AI-300 Certification

4 days (28 hours)

Overview

The Microsoft Machine Learning Operations Engineer Associate training course prepares you to scale machine learning and generative AI solutions on Azure by combining MLOps, GenAIOps, automation, and observability.

You'll learn how to build and automate Azure Machine Learning infrastructure, orchestrate model training, and manage their lifecycle using MLflow, GitHub Actions, and Infrastructure as Code practices.

The course also covers GenAIOps with Microsoft Foundry. You'll learn how to deploy and version AI models, applications, and agents; automate their delivery; and measure their quality, security, performance, and costs in production.

Finally, you'll explore the optimization of RAG systems, embeddings, and fine-tuning to improve the relevance and performance of GenAI solutions throughout their lifecycle.

Upon completion of the course, you'll be able to automate, deploy, monitor, and optimize ML and GenAI solutions on Azure and prepare for the Microsoft Certified: Machine Learning Operations Engineer Associate certification.

Like all our training courses, this one will introduce you to **the latest stable version** of the technology and its new features.

Objectives

- Design and automate an MLOps infrastructure with Azure Machine Learning
- Streamline the training, versioning, and deployment of machine learning models
- Implement CI/CD pipelines and Infrastructure as Code using GitHub Actions, Bicep, and Azure CLI
- Build a GenAIOps infrastructure with Microsoft Foundry
- Evaluate and monitor the quality, security, performance, and costs of GenAI applications and agents
- Optimize RAG systems, embeddings, and custom models
- Prepare for the Microsoft Machine Learning Operations Engineer Associate certification exam

Target Audience

- ML Engineers
- MLOps Engineers
- Data Scientists
- AI Engineers
- DevOps Engineers specializing in AI workloads

Requirements

- Have hands-on experience in machine learning and data science
- Proficiency in the fundamentals of Python development
- Understand the basic principles of MLOps, Git, and CI/CD
- Be familiar with Microsoft Azure and cloud services
- Understand the principles of LLMs, RAG, and generative AI

Technical Requirements

- Computer running Windows 10 or 11, macOS, or Linux, with at least 8 GB of RAM
- A Microsoft account linked to an Azure training subscription
- Python, Git, Azure CLI, and GitHub environments for automation and Infrastructure as Code exercises

Curriculum for our Microsoft Machine Learning Operations Engineer Associate Certification Training

[Day 1 - Morning]

Building an MLOps Infrastructure with Azure Machine Learning

- Understanding the MLOps architecture and the role of Azure Machine Learning in the model lifecycle
- Create and configure Azure Machine Learning workspaces, datastores, and compute targets

- Manage the data assets, environments, and components required for ML projects
- Share and version assets across multiple workspaces using Azure Machine Learning registries
- Configure the identities, RBAC roles, and network restrictions needed to secure ML environments

[Day 1 - Afternoon]

Automate ML infrastructure with Git and Infrastructure as Code

- Organize Machine Learning projects and manage their source code with Git
- Deploy Azure Machine Learning workspaces and resources using Bicep and the Azure CLI
- Set up secure integration between GitHub and Azure Machine Learning
- Automate resource provisioning with GitHub Actions
- Organize the development, validation, and production environments for an ML solution
- Hands-on workshop: Provision and secure the MLOps infrastructure for the flagship project using Bicep, Azure CLI, and GitHub Actions

[Day 2 - Morning]

Scale up machine learning model training and monitoring

- Run training scripts and jobs with Azure Machine Learning
- Track experiments, parameters, and metrics with MLflow
- Automate hyperparameter optimization and compare model performance
- Leverage AutoML when it meets the project's needs
- Build reusable training pipelines and manage distributed training scenarios
- Evaluate models based on their performance and Responsible AI principles

[Day 2 - Afternoon]

Version, deploy, and monitor models in production

- Register and version models with MLflow and Azure Machine Learning
- Manage the model lifecycle from validation to archiving
- Deploy models to real-time and batch inference endpoints
- Implement strategies for gradual deployment, testing, and secure rollback
- Detect data drift and monitor model performance in production
- Hands-on workshop: Industrialize the flagship project's model, automate its deployment, and trigger its retraining based on observed metrics

[Day 3 - Morning]

Building a GenAIOps Infrastructure with Microsoft Foundry

- Understanding the principles of GenAIOps and how they differ from the traditional MLOps cycle
- Create and configure Microsoft Foundry resources and projects
- Secure environments with Managed Identities, RBAC, and private network connectivity
- Provision Foundry resources using Bicep and the Azure CLI
- Select and deploy foundation models using serverless endpoints or managed compute resources
- Configure versioning, deployment, and capacity policies for GenAI workloads

[Day 3 - Afternoon]

Scale generative AI applications and agents

- Design and version prompts in Git repositories
- Create multiple prompt variants and compare their performance
- Structure the delivery cycle for AI applications and agents using GenAIOps practices
- Automate testing, validation, and deployment of GenAI components
- Manage versions of models, prompts, and configurations across different environments
- Hands-on workshop: Extend the overarching project with a versioned GenAI application integrated into an automated delivery pipeline

[Day 4 - Morning]

Evaluate and monitor GenAI applications and agents

- Create test datasets to evaluate generative AI applications and agents
- Measure the groundedness, relevance, coherence, and fluency of responses
- Assess risks, safety, and the presence of harmful content
- Automate evaluations with built-in and custom metrics
- Monitor latency, throughput, response times, and token consumption
- Configure logging, tracing, and debugging to diagnose GenAI applications in production

[Day 4 - Afternoon]

Optimize GenAI systems and prepare for AI-300 certification

- Optimize a RAG architecture by adjusting chunking, similarity thresholds, and retrieval strategies
- Select and optimize embedding models based on the data and business domain
- Combine semantic search and keyword search using hybrid search approaches
- Evaluate RAG performance using relevance metrics and A/B testing strategies
- Implement fine-tuning, synthetic data, and the lifecycle of custom models
- Review the knowledge base domains and representative scenarios for the AI-300 exam
- Final workshop: Optimize, evaluate, and monitor the project’s GenAI system, then analyze a scenario.

Target Audience

This training is intended for both individuals and companies—large or small—seeking to train their teams in new, advanced IT technologies or to acquire specific industry knowledge or modern methodologies.

Entry-Level Assessment

The pre-training assessment complies with Qualiopi quality standards. Upon final registration, the learner receives a self-assessment questionnaire that allows us to evaluate their estimated proficiency level across various types of technologies, as well as their expectations and personal goals for the upcoming training, within the limits imposed by the selected format. This questionnaire also allows us to anticipate certain connection or internal security issues within the company (intra-company or virtual classroom) that could pose challenges for monitoring and ensuring the smooth operation of the training session.

Teaching Methods

Hands-On Training: 60% Practical, 40% Theoretical. Training materials distributed in digital format to all participants.

Organization

The course alternates between theoretical input from the instructor—supported by examples and reflection sessions—and group work.

Assessment

At the end of the session, a multiple-choice quiz is administered to verify that participants have successfully acquired the skills.

Certification

A certificate will be issued to each trainee who has completed the entire training program.

Training organization registered under number 11 75 54743 75. This registration does not constitute state accreditation.
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