Training Course on Cloud MLOps on Azure (Azure ML Advanced)

Professional Development Training Course Outline

Category	Data Science	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In today's data-driven world, the rapid deployment and reliable operation of Machine Learning (ML) models are paramount for **business innovation** and **competitive advantage**. Training Course on Cloud MLOps on Azure (Azure ML Advanced): Deep dive into Azure services for MLOps. is meticulously designed to equip professionals with the cutting-edge skills and best practices required to streamline the entire **Machine Learning Lifecycle** on Microsoft Azure. Participants will gain a deep understanding of **MLOps principles**, leveraging Azure's robust services to build, deploy, monitor, and manage scalable and reproducible ML solutions in production environments.

This intensive program goes beyond basic model development, focusing on the crucial aspects of **operationalizing AI**. We will explore advanced Azure Machine Learning features, **DevOps for ML**, **CI/CD pipelines**, **model governance**, and **responsible AI** practices. Through hands-on labs and real-world case studies, attendees will master the tools and techniques to transform experimental ML models into impactful, production-ready applications, ensuring **model reliability**, **performance optimization**, and **cost efficiency** in the cloud.

Programme Curriculum

Training Course on Cloud MLOps on Azure (Azure ML Advanced): Deep dive into Azure services for MLOps.

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Course Objectives

Upon completion of this training, participants will be able to:

1. Architect MLOps solutions on Azure for scalable and robust ML deployments.
2. Implement end-to-end ML pipelines using Azure Machine Learning.
3. Master data versioning and feature store management with Azure capabilities.
4. Automate model training, hyperparameter tuning, and experiment tracking.
5. Deploy real-time inference and batch inference endpoints on Azure.
6. Establish robust CI/CD for MLOps using Azure DevOps and GitHub Actions.
7. Monitor model performance, data drift, and concept drift in production.
8. Implement model retraining strategies and model governance frameworks.
9. Apply responsible AI principles and tools for ethical model deployment.
10. Optimize resource utilization and manage Azure ML costs effectively.
11. Troubleshoot common MLOps challenges and implement best practices.
12. Leverage Azure Kubernetes Service (AKS) for containerized ML deployments.
13. Integrate Azure security and compliance into MLOps workflows.

Organizational Benefits

- Rapidly deploy and iterate on ML models, bringing AI-powered solutions to production faster.
- Improve the stability, performance, and reproducibility of machine learning models.
- Optimize resource allocation and automate workflows, leading to significant cost savings.
- Foster seamless collaboration between data scientists, ML engineers, and operations teams.
- Establish robust frameworks for model versioning, auditing, and responsible AI.
- Build and manage highly scalable ML systems capable of handling growing data volumes and model complexities.
- Ensure continuous model accuracy and relevance, enabling more informed business decisions.

Target Audience

1. Data Scientists.
2. Machine Learning Engineers.
3. DevOps Engineers.
4. AI Developers.
5. Cloud Architects.
6. IT Professionals.

7. Solution Architects.
8. Technical Leads

Course Outline

Module 1: Introduction to MLOps and Azure ML Ecosystem

- Understanding the MLOps Lifecycle and its importance.
- Overview of Azure Machine Learning workspace and core components.
- Key MLOps principles: Automation, Reproducibility, Monitoring, Governance.
- Setting up your Azure ML environment and resources.
- **Case Study:** *Contoso's initial struggle with manual model deployments and inconsistent results.*

Module 2: Data Versioning and Management for MLOps

- Strategies for effective data versioning using Azure Blob Storage and Azure Data Lake.
- Implementing a Feature Store with Azure Data Explorer or managed services.
- Data validation and quality checks in automated pipelines.
- Best practices for data lineage and traceability.
- **Case Study:** *Fabrikam's challenge in reproducing model results due to unversioned datasets and a lack of a centralized feature store.*

Module 3: Experiment Tracking and Model Registry

- Tracking ML experiments with MLflow in Azure Machine Learning.
- Logging metrics, parameters, and artifacts for reproducibility.
- Managing and versioning models in the Azure ML Model Registry.
- Comparing experiments and selecting the best performing models.
- **Case Study:** *Adventure Works' difficulty in comparing numerous model iterations and identifying the most optimal model for production.*

Module 4: Automated ML (AutoML) and Hyperparameter Tuning

- Leveraging Azure AutoML for efficient model selection and hyperparameter optimization.
- Understanding different AutoML configurations and algorithms.
- Advanced hyperparameter tuning with HyperDrive in Azure ML.
- Distributed training for large-scale model development.
- **Case Study:** *Northwind Traders' need to quickly prototype and identify high-performing models without extensive manual tuning.*

Module 5: Building Scalable ML Pipelines in Azure ML

- Designing and implementing ML pipelines using Azure ML Python SDK and Designer.
- Orchestrating complex workflows with parallel and conditional steps.
- Component reusability and modular pipeline design.
- Managing compute targets for different pipeline stages.
- **Case Study:** *Tailwind Traders' effort to automate their ETL, training, and evaluation steps into a robust, repeatable workflow.*

Module 6: Model Deployment: Real-time and Batch Inference

- Deploying models as real-time web services using Azure Kubernetes Service (AKS) and Azure Container Instances (ACI).

- Implementing batch inference with Azure Machine Learning pipelines.
- Understanding endpoint management and scaling strategies.
- Securing deployed models with Azure Active Directory.
- **Case Study:** *Fourth Coffee's requirement for a low-latency recommendation engine and a daily batch processing job for inventory forecasting.*

Module 7: CI/CD for MLOps with Azure DevOps

- Integrating Azure DevOps with Azure Machine Learning for MLOps.
- Building CI pipelines for code and model changes.
- Implementing CD pipelines for automated model deployment.
- Strategies for blue/green deployments and canary releases.
- **Case Study:** *Wide World Importers' initiative to automate their model update process, reducing manual errors and deployment time.*

Module 8: MLOps with GitHub Actions

- Leveraging GitHub Actions for continuous integration and deployment of ML solutions.
- Creating custom workflows for MLOps tasks.
- Managing secrets and environments in GitHub Actions.
- Comparing and contrasting Azure DevOps vs. GitHub Actions for MLOps.
- **Case Study:** *Proseware's decision to use GitHub as their primary code repository and integrate MLOps directly into their existing CI/CD processes.*

Module 9: Model Monitoring and Performance Management

- Implementing data drift detection and concept drift monitoring.
- Monitoring model performance metrics (accuracy, precision, recall, F1-score).
- Setting up alerts and notifications for model degradation.
- Using Azure Monitor and Application Insights for comprehensive observability.
- **Case Study:** *Graphic Design Institute's challenge with declining model accuracy over time due to shifts in user behavior data.*

Module 10: Model Retraining and Lifecycle Management

- Triggering automated model retraining based on performance degradation or data drift.
- Implementing A/B testing for new model versions.
- Strategies for safe model rollback and versioning.
- Managing the entire model lifecycle from development to retirement.
- **Case Study:** *The Phone Company's need for a robust system to automatically retrain their churn prediction model when its performance drops below a threshold.*

Module 11: Responsible AI and Explainability

- Understanding Responsible AI principles in MLOps.
- Techniques for model explainability (interpretable ML) using Azure ML Interpretability.
- Bias detection and mitigation strategies.
- Fairness and transparency in AI systems.
- **Case Study:** *Adatum's commitment to ensuring their credit scoring model is fair and transparent, avoiding discriminatory outcomes.*

Module 12: MLOps Security and Governance on Azure

- Implementing role-based access control (RBAC) in Azure ML.

- Securing data and compute resources.
- Compliance considerations for MLOps workflows (e.g., GDPR, HIPAA).
- Auditing and logging for accountability.
- **Case Study:** *Contoso's strict regulatory requirements for data privacy and model access in their healthcare AI applications.*

Module 13: Cost Optimization in Azure MLOps

- Strategies for optimizing compute and storage costs in Azure ML.
- Leveraging managed endpoints and autoscaling.
- Monitoring and analyzing Azure ML spending.
- Choosing the right VM sizes and pricing tiers.
- **Case Study:** *Trey Research's goal to reduce their monthly Azure ML expenditure while maintaining performance and scalability.*

Module 14: Advanced MLOps Scenarios and Customization

- Extending Azure ML with custom Docker images and environments.
- Integrating third-party MLOps tools (e.g., MLflow, DVC) with Azure.
- Serverless MLOps with Azure Functions and Logic Apps.
- Edge AI deployments with Azure IoT Edge.
- **Case Study:** *Humongous Insurance's unique requirement to deploy a lightweight ML model directly on IoT devices for real-time anomaly detection.*

Module 15: MLOps Best Practices and Future Trends

- Review of industry best practices for MLOps on Azure.
- Emerging trends in MLOps: LLMOps, prompt engineering, MLOps for Generative AI.
- Building a culture of MLOps within organizations.
- Continuous learning and staying updated with Azure ML advancements.
- **Case Study:** *Coho Winery's vision to explore the application of Generative AI in their marketing and product development, requiring new MLOps paradigms.*

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$12,000

Ready to enroll or request a customized program? Book online or contact us:

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