

# Fabric with MLOps: End-to-End AI Solutions

## Course Description

A hands-on program designed to help professionals build, deploy, and operationalize machine learning solutions using **Microsoft Fabric** and **MLOps best practices**. Participants will learn to integrate data engineering, model development, deployment, monitoring, and visualization into a seamless workflow.

## Prerequisites

- Basic Python programming knowledge
- Familiarity with machine learning concepts (training, evaluation, deployment)
- Understanding of cloud computing fundamentals (Azure preferred)
- Exposure to SQL or data analysis tools is helpful

## Content Coverage

### Day 1 – Module 1: Foundations of Microsoft Fabric & MLOps

- **Microsoft Fabric Overview**
  - Fabric architecture and unified data platform
  - Key components: Data Factory, Synapse, Lakehouse, Power BI
  - Role of Fabric in modern data ecosystems
- **MLOps Fundamentals**
  - Definition and importance of MLOps
  - ML lifecycle stages: ingestion → training → deployment → monitoring
  - Tools: Azure ML, MLflow, GitHub Actions
- **Environment Setup**
  - Creating Fabric workspace
  - Integrating Fabric with Azure ML
  - Setting up GitHub/DevOps for version control
- **Hands-On Lab**
  - Build a simple pipeline in Fabric for data ingestion and cleaning

## Day 2 – Module 2: Building & Operationalizing ML Models

- **Data Engineering in Fabric**
  - Using Lakehouse for structured/unstructured data
  - Data pipelines with Data Factory
  - Feature engineering workflows
- **Model Development**
  - Training models in Azure ML
  - Experiment tracking with MLflow
  - Hyperparameter tuning & reproducibility
- **MLOps Practices**
  - CI/CD for ML models
  - Automated retraining pipelines
  - Model registry & versioning
- **Hands-On Lab**
  - Train a predictive model (e.g., customer churn) and register it in Azure ML

## Day 3 – Module 3: End-to-End Integration & Deployment

- **Model Deployment**
  - Deploying models as REST APIs
  - Integrating with Fabric pipelines
  - Real-time vs batch scoring approaches
- **Monitoring & Governance**
  - Model drift detection techniques
  - Performance monitoring dashboards
  - Responsible AI and compliance practices
- **Visualization & Insights**
  - Connecting deployed models to Power BI
  - Building interactive dashboards
  - Sharing insights across the organization
- **Capstone Lab**
  - End-to-end solution: Ingest → Train → Deploy → Monitor → Visualize