

# Mastering MLOps: Complete Course on ML Operations

Course Duration: 03 days

**Note:** Labs for almost all modules can be performed on open source. So Koenig DC can be provided. Student can also install software's on their own system

## Module 1: MLOps Fundamentals

- Introduction to MLOps and its significance
- Challenges in traditional ML model management
- Solutions offered by MLOps

## Module 2: MLOps Toolbox

- Applying MLOps tools for end-to-end projects
- Integration of tools: DVC, Git, MLFlow, and DagsHub

## Module 3: Model Versioning with MLFlow

- Versioning and registering ML models with MLFlow
- MLflow's role in managing ML lifecycle

## Module 4: Data Versioning with DVC

- Capturing data and model versions with DVC
- On-premises and cloud storage integration

## Module 5: Creating Shared ML Repository

- Utilizing DagsHub, DVC, Git, and MLFlow for versioning
- Collaborative ML model management

## Module 6: Auto-ML and Low-Code MLOps

- Automation of ML model development with Auto-ML and Pycaret
- Streamlining model versioning, training, evaluation, and deployment

## Module 7: Explainability and Auditability

- Understanding model interpretability and explainability
- Monitoring model performance and data drift with SHAP and Evidently

## Module 8: Containerized ML Workflow with Docker

- Packaging code and dependencies using Docker
- Efficient distribution of Machine Learning applications

## Module 9: Deploying ML via APIs

- Model deployment through API development with FastAPI and Flask
- Deploying APIs on Azure Cloud using containers

## Module 10: Deploying ML in Web Applications

- Developing web apps with embedded ML models using Gradio and Flask
- Deploying to production in Azure via Docker containers

## Module 11: Automated ML Services with BentoML

- Introduction to BentoML and its role in automated ML service development
- Putting BentoML services into production using Docker
- Integration of BentoML with MLFlow

## Module 12: CI/CD with GitHub Actions and CML

- Introduction to GitHub Actions and Continuous Machine Learning (CML)
- Practical lab: GitHub Actions for MLOps CI/CD

## Module 13: Model Monitoring with Evidently AI

- Monitoring models and services using Evidently AI
- Identifying data drift and evaluating model quality

## Module 14: Model Monitoring with Deepchecks

- Components of Deepchecks: checks, conditions, and suites
- Hands-on experience with Data Integrity Suite, Train Test Validation Suite, Model Evaluation Suite, and Custom Performance Suite

## Module 15: Complete MLOps Project

- Developing an ML model from scratch
- Validating code and preprocessing data
- Versioning with MLFlow and DVC
- Sharing repository with DagsHub and MLFlow
- Building an API with BentoML
- Creating a Streamlit app
- Implementing CI/CD with GitHub Actions