

# MLOps Certification Training Course

Course Curriculum : Your 11 module Learning Plan

<https://www.edureka.co/mlops-certification-training-course>

## About Edureka

Edureka is a leading e-learning platform providing live instructor-led interactive online training. We cater to professionals and students across the globe in categories like Big Data & Hadoop, Business Analytics, NoSQL Databases, Java & Mobile Technologies, System Engineering, Project Management and Programming. We have an easy and affordable learning solution that is accessible to millions of learners. With our students spread across countries like the US, India, UK, Canada, Singapore, Australia, Middle East, Brazil and many others, we have built a community of over 1 million learners across the globe.

## About Course

Embark on a transformative journey through Edureka's all-encompassing MLOps course, which helps learners master the cutting-edge techniques and tools for extensive exploration of the complexities associated with the deployment, monitoring, and administration of machine learning models in live operational settings. Through the immersive, industry-relevant use cases covered in this course, learners will be able to put their acquired knowledge into practice. Join us now and propel your career to the next level.

## Curriculum

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### MLOps Essentials

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Topics:

- Introduction to MLOps
- MLOps vs. DevOps
- SDLC Basics
- Waterfall vs AGILE vs DevOps vs MLOps
- MLOps Phases
- Versioning
- Testing
- Automation
- Reproducibility
- Deployment
- Monitoring
- MLOPs Architecture
- ML Pipeline
- MLOps Tools
- MLOPs Case Study

Hands-on:

- MLOps Case Study

Skills You will Learn

- Understanding MLOps Concepts
- Proficiency in SDLC Methodologies

## Version Control System

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Topics:

- Git Essentials
- Configuring Git
- Branching
- Git Workflow
- Repo
- Git Commands
- GitHub Action

Hands-on:

- Git Common Commands
- Branching and Merging

Skills You will Learn

- Tracking and managing changes to code
- Source Code Management
- Tracking and Saving Changes in Files

## Packaging ML Models

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Topics:

- Model Packaging
- Experimentation
- Model Fitting
- Challenges in Working inside the Jupyter Notebook
- Create Config Module
- Data Handling Module

- Data Preprocessing Data Preprocessing
- Pipelines
- Training and Prediction
- Requirements.txt file
- Testing Virtual Environments
- Pytest
- Model Packaging and Testing

Hands-on:

- ML Model Packaging and Testing

Skills You will Learn

- Model Packaging Techniques
- Data Preprocessing and Handling s
- Testing and Validation of ML models

## Build MLApps using New Age Tools

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Topics:

- API Essentials
- Streamlit Fundamentals
- Working with Flask
- REST API
- FAST API
- Building ML Model with Streamlit
- Creating ML Model with Flask
- ML Model Deployment with FAST API

Hands-on:

- Developing ML models using Streamlit

- Building ML models using Flask
- Deploying ML models using FAST API

## Skills You will Learn

- ML Application Development
- ML Pipelines with FAST API

## CI/CD for ML Models

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### Topics:

- Introduction to CI/CD
- CI/CD Challenges
- CI/CD Implementation in ML
- Popular DevOps Tools
- AWS CodeCommit
- AWS CodePipeline
- AWS CodeBuild
- AWS CodeDeploy
- Azure Boards
- Azure Repos
- Azure Pipeline
- Azure Test Plans
- Azure Artifacts

### Hands-on:

- Building CI/CD Pipelines

## Skills You will Learn

- Implementation of CI/CD Pipelines for ML

## Machine Learning Model Management

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Topics:

- What is Model Management?
- Activities in Model Management
- Data Versioning
- Code Versioning
- Experiment Tracking
- Model Cataloging
- Model Monitoring
- Overview of Model Management tools
- Working with MLFlow

Hands-on:

- Working with MLFlow

Skills You will Learn

- Data Management
- Code Versioning
- Experiment Tracking

## Docker and Kubernetes for ML Deployment

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Topics:

- Containerization
- Docker
- Docker Architecture
- Docker for Machine Learning
- Docker Desktop Installation

- Working with Docker
- Running Docker Container
- Dockerfile
- Pushing Docker Image to DockerHub
- Dockerize the ML Model
- Container Orchestration
- Kubernetes Core Concepts
- Pod
- Deployment
- Replica
- Service
- Volumes (PVC)
- Monitoring
- Liveness and Readiness Probes
- Labels and Selectors

#### Hands-on:

- Docker CLI Commands
- Writing a Dockerfile Deployments
- DaemonSets
- Deploying Services

#### Skills You will Learn

- Continuous Deployment
- Writing a Dockerfile to Create an Image
- Installing Docker Compose
- Configuring Local Registry
- Container Orchestration
- Application Deployment

## Monitoring and Debugging of ML System

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Topics:

- Model Monitoring Importance
- Tools for Model Monitoring
- Understanding ML Model Monitoring
- Challenges in Monitoring ML Models
- Exploring Model Drift Phenomenon
- Operational Level Monitoring Insights
- Introduction to Prometheus Monitoring System
- WhyLabs Setup Process
- Exploring WhyLogs Features: Drift Detection, Input/Output Monitoring, Bias Detection
- WhyLogs Usage: Constraints and Drift Reports

Hands-on:

- ML Model Monitoring
- Monitoring using WhyLogs

Skills You will Learn

- Model Monitoring and Debugging

## Kubeflow for Building ML Pipelines

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Topics:

- Kubeflow Introduction
- Features
- Kubeflow Fairing
- Kubeflow Pipelines
- Working with Kubeflow

Hands-on:

- Building ML Pipeline with Kubeflow

Skills You will Learn

- Building end-to-end ML pipelines with Kubeflow

## MLOps on Cloud

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Topics:

- Getting Started with Amazon Sagemaker
- Amazon SageMaker Notebooks Overview
- Configuration of Notebook Instance
- Creating, Training, and Deploying ML Models with Sagemaker
- Setting up Endpoints and Endpoint Configurations
- Executing Inference from Deployed Models
- Exploring SageMaker Studio & Domain Features
- Introduction to SageMaker Projects
- Understanding Repositories in SageMaker
- Utilizing Pipelines and Graphs in SageMaker
- Conducting Experiments with SageMaker
- Managing Model Groups in SageMaker
- Configuring Endpoints in SageMaker
- Introduction to Azure Machine Learning Studio
- Exploring Azure MLOps
- Understanding Azure ML Components
- Integration of Azure MLOps with DevOps
- Setting up Fully Automated End-to-End CI/CD ML Pipelines

Hands-on:

- Building an end-to-end MLOps pipeline using AWS SageMaker

## Skills You will Learn

- Using Amazon SageMaker for ML development and deployment
- Management of ML Models and Experiments using Azure Machine Learning

## ML Model Post Deployment Challenges (Self-paced)

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### Topics:

- Ensuring Model Integrity
- Counteracting Adversarial Attacks
- Guarding Against Data Poisoning
- Preventing Distributed Denial of Service (DDOS)
- Safeguarding Data Privacy
- Strategies for Mitigating Model Attack Risks
- Implementing A/B Testing Methodologies
- Outlook on the Future of MLOps

### Hands-on:

- Implementing A/B Testing Methodologies

## Skills You will Learn

- Implementation of A/B testing methodologies for model evaluation
- Strategies for Ensuring model Integrity and Security