# MLOps for Reproducible Research and Model Deployment Training Course

Professional Development Training Course Outline

| | | | |
|---|---|---|---|
| **Category** | Research and Data Analysis | **Duration** | 5 Days |
| **Base Fee** | $1,500 USD | **Delivery Mode** | Online / On-site Hybrid |

## Course Introduction

In today’s fast-paced data science landscape, the demand for scalable, automated, and reproducible machine learning workflows is higher than ever. MLOps (Machine Learning Operations) bridges the gap between research and production by offering a systematic approach to deploying machine learning models with speed, scalability, and reliability. MLOps for Reproducible Research and Model Deployment Training Course is designed to empower data scientists, ML engineers, and research professionals with cutting-edge MLOps practices, tools, and frameworks to ensure reproducible research, automated workflows, and robust model deployment across diverse environments.

Whether you're working in academic research or enterprise AI, mastering MLOps is essential to boost your productivity and maintain trust in your models. By combining version control, CI/CD, containerization, model monitoring, and governance, this hands-on training ensures you're equipped with the skills needed to build, test, and deploy models seamlessly and consistently. Participants will gain practical exposure through industry-relevant case studies and labs that reflect real-world MLOps challenges and solutions.

## Programme Curriculum

**MLOps for Reproducible Research and Model Deployment Training Course**

**Introduction**

In today’s fast-paced data science landscape, the demand for scalable, automated, and reproducible machine learning workflows is higher than ever. MLOps (Machine Learning Operations) bridges the gap between research and production by offering a systematic approach to deploying machine learning models with speed, scalability, and reliability. MLOps for Reproducible Research and Model Deployment Training Course is designed to empower data scientists, ML engineers, and research professionals with cutting-edge MLOps practices, tools, and frameworks to ensure reproducible research, automated workflows, and robust model deployment across diverse environments.

Whether you're working in academic research or enterprise AI, mastering MLOps is essential to boost your productivity and maintain trust in your models. By combining version control, CI/CD, containerization, model monitoring, and governance, this hands-on training ensures you're equipped with the skills needed to build, test, and deploy models seamlessly and consistently. Participants will gain practical exposure through industry-relevant case studies and labs that reflect real-world MLOps challenges and solutions.

**Course Objectives**

1. Understand the fundamentals of MLOps principles and lifecycle management.
2. Implement reproducibility best practices using Git, DVC, and MLFlow.
3. Build CI/CD pipelines for automated ML workflows.
4. Integrate data versioning into ML experiments for traceability.
5. Deploy machine learning models using Docker and Kubernetes.
6. Apply model registry systems for tracking and version control.
7. Monitor deployed models for drift detection and performance.
8. Use cloud-native MLOps tools like AWS SageMaker, Azure ML, or Google Vertex AI.
9. Develop model explainability and fairness reporting in production.
10. Apply infrastructure as code (IaC) for reproducible environments.
11. Ensure governance and compliance in model deployment pipelines.
12. Collaborate effectively using experiment tracking and reproducible research protocols.
13. Solve real-world challenges through domain-specific case studies in health, finance, and manufacturing.

**Target Audiences**

1. Data Scientists
2. Machine Learning Engineers
3. AI Researchers
4. DevOps Engineers
5. Software Developers transitioning to MLOps
6. Cloud Architects
7. Research Analysts
8. Postgraduate Students in Data Science

**Course Duration:** 5 days

**Course Modules**

**Module 1: Introduction to MLOps & Reproducibility**

- What is MLOps? Importance and Benefits
- Principles of Reproducible Research
- Common Challenges in ML Projects
- Introduction to ML Lifecycle Management
- Tools Overview: Git, DVC, MLFlow
- **Case Study:** Tracking Experiments in Academic Research with MLFlow

**Module 2: Data Versioning & Experiment Tracking**

- Implementing Data Version Control (DVC)
- MLFlow for Metrics & Artifact Tracking
- Structuring Experiments for Reproducibility
- Logging and Documentation Practices
- Managing Data Pipelines at Scale
- **Case Study:** Data Provenance in Climate Change Models

**Module 3: CI/CD for Machine Learning**

- Introduction to CI/CD for ML Pipelines
- Jenkins, GitHub Actions, GitLab CI for ML
- Testing and Validation Strategies
- Automating Model Retraining
- Integration with Docker & Kubernetes
- **Case Study:** Building a Continuous Deployment Pipeline for Retail Forecasting

**Module 4: Containerization & Orchestration**

- Docker Essentials for ML Projects
- Kubernetes for Scalable Model Deployment
- Helm Charts and Kubernetes Operators
- Environment Reproducibility using Dockerfiles
- Security Considerations for Containers
- **Case Study:** Scalable Deployment of NLP Models in Healthcare

**Module 5: Model Deployment & Serving**

- RESTful APIs for Model Serving
- TensorFlow Serving and TorchServe
- Batch vs Real-Time Inference
- A/B Testing and Canary Deployments
- Integrating with Edge and Cloud
- **Case Study:** Real-Time Fraud Detection System on AWS

**Module 6: Model Monitoring & Drift Detection**

- Monitoring Tools: Prometheus, Grafana
- Model Drift vs Concept Drift
- Feedback Loops and Retraining
- Alerting and Logging Frameworks
- Model Performance Metrics in Production
- **Case Study:** Monitoring Image Classification Models in Manufacturing

**Module 7: Governance, Ethics & Compliance**

- Regulatory Requirements for ML Models
- Model Explainability and Transparency
- Bias Detection and Mitigation
- Documentation and Audits
- Role-Based Access and ML Security
- **Case Study:** Explainable AI in Credit Scoring

**Module 8: Cloud MLOps Tools & Final Project**

- Overview of AWS SageMaker, Azure ML, and Google Vertex AI
- ML Infrastructure as Code with Terraform
- Running Pipelines in the Cloud
- Scaling ML Workloads Across Teams
- Capstone Deployment Project Presentation
- **Case Study:** End-to-End Deployment using Vertex AI for Disease Prediction

**Training Methodology**

- Instructor-led interactive live sessions

- Hands-on lab exercises with cloud-based tools
- Step-by-step project-based learning
- Real-world case studies and portfolio development
- Group activities and peer collaboration
- Assessment through quizzes and capstone project

**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** | 27 Nov 2026 | Online | $1,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $1,500 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $3,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $3,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $4,500 |

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |

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

**Register Online Now**

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com