

DevOps for Machine Learning: CI/CD, APIs & Deployment

Full course syllabus - every module, video lesson, reading and assignment, from Git workflows to deployed containers.



Board Infinity

Instructor · Offered on Coursera

4

Modules

28

Video lessons

16

Assignments

2 weeks

At 10 hours a week

INSIDE THE COURSE

01

Version Control and Automation Foundations

5 hours to complete

02

ML Pipeline Automation

5 hours to complete

03

Building and Serving ML APIs

5 hours to complete

04

Packaging and Deployment

5 hours to complete

Enroll on Coursera

<https://www.coursera.org/learn/devops-for-machine-learning-ci-cd-apis-and-deployment>

A trained model is the start.

DevOps for Machine Learning teaches you to automate, test, containerize and deploy ML models using Git, GitHub Actions, Docker and FastAPI - bringing DevOps discipline into machine learning workflows.

It moves in four steps - version control and automation foundations, ML pipeline automation, building and serving ML APIs, then packaging and deployment - with 28 videos, 12 readings and 16 assignments in all.

WHO IT'S FOR

Aspiring MLOps engineers

Foundations in CI/CD, deployment and automation.

Data scientists

Taking trained models beyond the notebook.

Developers

Applying DevOps practice to ML applications.

Before you start

Basic Python and ML: training a model, working with datasets.

WHAT YOU'LL LEARN

01

Automate

Modules 1-2

Build CI/CD pipelines with GitHub Actions to automate ML testing, training, and deployment workflows

02

Serve

Module 3

Develop REST APIs for ML models using FastAPI with validation, error handling, and OpenAPI docs

03

Containerize

Modules 1, 2 & 4

Containerize ML applications using Docker and optimize multi-stage builds for production

04

Reproduce

Modules 1-2

Apply Git, DVC, and automated testing to create reproducible, version-controlled ML projects

Four modules, from Git to deployment.

2 weeks to complete at 10 hours a week. Flexible schedule - learn at your own pace.

01

Version Control and Automation Foundations

5 hours

The DevOps mindset for ML: Git, CI/CD basics and testing

9 videos

BY THE END OF THIS MODULE YOU CAN

- ✓ Use Git workflows for ML projects, with Git LFS and DVC basics
- ✓ Set up CI/CD basics with GitHub Actions and workflow YAML
- ✓ Test ML code and data, and manage secrets in containers

CONTENTS 9 videos (60 min) · 3 readings (90 min) · 4 assignments (150 min)

TOPICS

Git Workflows for ML

CI/CD Basics with GitHub Actions

Testing ML Code and Data

You'll leave with: version control, CI/CD basics and tests for code and data.

02

ML Pipeline Automation

5 hours

Automating the ML lifecycle with Docker Compose and CI/CD

7 videos

BY THE END OF THIS MODULE YOU CAN

- ✓ Run ML APIs and databases together with Docker Compose
- ✓ Define pipeline stages and implement them with GitHub Actions
- ✓ Test and validate automated pipelines

CONTENTS 7 videos (67 min) · 3 readings (90 min) · 4 assignments (150 min)

TOPICS

Defining Pipeline Stages

GitHub Actions for ML Pipelines

Testing and Validating Pipelines

You'll leave with: automated ML pipelines you can test and validate.

03

Building and Serving ML APIs

5 hours

Real-time model serving with FastAPI - testing and documentation

6 videos

BY THE END OF THIS MODULE YOU CAN

- ✓ Serve an ML model with FastAPI and connect models to APIs
- ✓ Start the API and test, document and debug its endpoints
- ✓ Set up multi-step workflows with log-based debugging

CONTENTS 6 videos (38 min) · 3 readings (90 min) · 4 assignments (150 min)

TOPICS

FastAPI for Model Serving

Connecting Models to APIs

Testing and Documenting APIs

You'll leave with: a model served as a tested, documented real-time API.

04

Packaging and Deployment

5 hours

Containerized ML services with automated deployment

6 videos

BY THE END OF THIS MODULE YOU CAN

- ✓ Build and run ML containers, and manage services with Compose
- ✓ Deploy containers with CI/CD
- ✓ Monitor and verify deployed services

CONTENTS 6 videos (43 min) · 3 readings (90 min) · 4 assignments (150 min)

TOPICS

Docker Fundamentals for ML

Building and Running ML Containers

Deploying Containers with CI/CD

You'll leave with: containerized ML services, deployed and monitored.

The tools you work in.



Git & DVC

Where code lives

Git workflows, with Git LFS and DVC for data.

In this course: Versioning code and data together from module one.

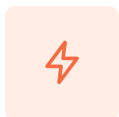


GitHub Actions & pytest

What automates it

CI/CD workflows and automated tests.

In this course: Testing ML code and data, then ML pipelines.



FastAPI

How it's served

REST APIs for real-time predictions.

In this course: Serving, testing and documenting endpoints.



Docker & Compose

How it ships

Multi-stage builds and multi-container services.

In this course: Containers deployed with CI/CD, then monitored.

SKILLS YOU LEAVE WITH

Automating it

- ✓ DevOps
- ✓ Automation
- ✓ Continuous Integration
- ✓ CI/CD

Checking it

- ✓ Version Control
- ✓ API Testing
- ✓ Data Validation
- ✓ Model Evaluation

Shipping it

- ✓ Containerization
- ✓ Continuous Deployment
- ✓ Application Deployment
- ✓ MLOps

Finish with a shareable certificate.

**Add it to LinkedIn**

Add this credential to your LinkedIn profile, resume, or CV.

**Share it anywhere**

Share it on social media and in your performance review.

**Earned, not attended**

Awarded on a graded quiz in each of the four modules.

**Course 1 of 3**

Part of the Machine Learning Operations (MLOps) Specialization.

WHERE THESE SKILLS APPLY

Aspiring MLOps engineers

Data scientists

Developers

CI/CD & automation

API development

Containerization & deployment

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