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This course is part of the **Machine Learning Engineering for Production (MLOps) Specialization**

Introduction to Machine Learning in Production

★★★★★ 4.8 1,063 ratings • 193 reviews



Andrew Ng +1 more instructor

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About this Course

162,204 recent views

In the first course of Machine Learning Engineering for Production Specialization, you will identify the various components and design an ML production system end-to-end: project scoping, data needs, modeling strategies, and deployment constraints and requirements; and learn how to establish a model baseline, address concept drift, and prototype the process for developing, deploying, and continuously improving a productionized ML application.

Understanding machine learning and deep learning concepts is essential, but if you're looking to build an effective AI career, you need production engineering capabilities as well. Machine learning engineering for production combines the foundational concepts of machine learning with the functional expertise of modern software development and engineering roles to help you develop production-ready skills.

Week 1: Overview of the ML Lifecycle and Deployment

Week 2: Selecting and Training a Model

Week 3: Data Definition and Baseline

WHAT YOU WILL LEARN

- ✓ Identify the key components of the ML lifecycle and pipeline and compare the ML modeling iterative cycle with the ML product deployment cycle.
- ✓ Understand how performance on a small set of disproportionately important examples may be more crucial than performance on the majority of examples.
- ✓ Solve problems for structured, unstructured, small, and big data. Understand why label consistency is essential and how you can improve it.

SKILLS YOU WILL GAIN

Human-level Performance (HLP) | Concept Drift | Model baseline | Project Scoping and Design
ML Deployment Challenges

Flexible deadlines

Reset deadlines in accordance to your schedule.

Shareable Certificate

Earn a Certificate upon completion

100% online

Start instantly and learn at your own schedule.

Course 1 of 4 in the

Machine Learning Engineering for Production (MLOps) Specialization

Advanced Level

- Some knowledge of AI / deep learning
- Intermediate Python skills
- Experience with any deep learning framework (PyTorch, Keras, or TensorFlow)

Approx. 10 hours to complete

English

Subtitles: English

Instructors

Instructor rating 4.95/5 (449 Ratings) [\(1\)](#)Andrew Ng [TOP INSTRUCTOR](#)

Instructor

Founder, DeepLearning.AI & Co-founder, Coursera

5,548,330 Learners

31 Courses

Cristian Bartolomé Arámburu [TOP INSTRUCTOR](#)

Curriculum Developer

35,400 Learners

1 Course

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DeepLearning.AI is an education technology company that develops a global community of AI talent.

DeepLearning.AI's expert-led educational experiences provide AI practitioners and non-technical professionals with the necessary tools to go all the way from foundational basics to advanced application, empowering them to build an AI-powered future.



The Specialization I took blew my mind. Each course was interesting, fun, and motivational, which encouraged me to continue learning.

— Lisa L



I want to learn new things, because that's what brings joy to my life. With Coursera, I can meet and interact with others who feel the same way.

— Harry S.



Coursera gave me confidence and helped me learn anything if I put my mind to it. I break into a new industry.



Other courses in this Specialization

 Machine Learning Data Lifecycle in Production DeepLearning.AI 1 COURSE	 Machine Learning Modeling Pipelines in Production DeepLearning.AI 1 COURSE	 Deploying Machine Learning Models in Production DeepLearning.AI 1 COURSE
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Syllabus - What you will learn from this course

Content Rating  97% (3,605 ratings) ⓘ

WEEK

 3 hours to complete

1

Week 1: Overview of the ML Lifecycle and Deployment

This week covers a quick introduction to machine learning production systems focusing on their requirements and challenges. Next, the week focuses on deploying production systems and what is needed to do so robustly while facing constantly changing data.

9 videos (Total 81 min), 3 readings, 3 quizzes [SEE LESS](#) 9 videos

Specialization overview 6m

Welcome 9m

Steps of an ML Project 3m

Case study: speech recognition 12m

Course outline 2m

Key challenges 14m

Deployment patterns 11m

Monitoring 10m

Pipeline monitoring 9m



3 readings

Have questions? Meet us on Discourse! 2m

Week 1 Optional References 3m

Ungraded Lab - Deploying a Deep Learning model 1h 30m



2 practice exercises

The Machine Learning Project Lifecycle 10m

Deployment 10m

WEEK

 3 hours to complete

2

Week 2: Select and Train a Model

This week is about model strategies and key challenges in model development. It covers error analysis and strategies to work with different data types. It also addresses how to cope with class imbalance and highly skewed data sets.

16 videos (Total 107 min), 1 reading, 3 quizzes [SEE LESS](#) 16 videos

Modeling overview 2m

Key challenges 5m

Why low average error isn't good enough 10m

Establish a baseline 7m

Tips for getting started 6m

Error analysis example 8m

Prioritizing what to work on 5m

Skewed datasets 12m

Performance auditing 7m

Data-centric AI development 2m

A useful picture of data augmentation 5m

Data augmentation 8m

Can adding data hurt? 6m

Adding features 8m

Experiment tracking 4m

From big data to good data 3m

 **1 reading**

Week 2 Optional References 3m

 **2 practice exercises**

Selecting and Training a Model 10m

Modeling challenges 10m

WEEK

3

 **4 hours to complete**

Week 3: Data Definition and Baseline

This week is all about working with different data types and ensuring label consistency for classification problems. This leads to establishing a performance baseline for your model and discussing strategies to improve it given your time and resources constraints.

 16 videos (Total 128 min), 3 readings, 3 quizzes [SEE LESS](#)

 **16 videos**

Why is data definition hard? 4m

More label ambiguity examples 9m

Major types of data problems 11m

Small data and label consistency 8m

Improving label consistency 9m

Human level performance (HLP) 10m

Raising HLP 9m

Obtaining data 12m

Data pipeline 5m

Meta-data, data provenance and lineage 9m

Balanced train/dev/test splits 4m

What is scoping? 2m

Scoping process 6m

Diligence on feasibility and value 14m

Diligence on value 7m

Milestones and resourcing 2m

 **3 readings**

Week 3 Optional References 3m

References 5m

Acknowledgments 3m

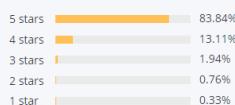
 **2 practice exercises**

Data Stage of the ML Production Lifecycle 20m

Scoping (optional) 10m

Reviews

4.8 193 reviews



TOP REVIEWS FROM INTRODUCTION TO MACHINE LEARNING IN PRODUCTION

by RG Jun 5, 2021

really a great course. It'll really change your way of thinking ML in production use and will help you better understand how can you leverage the power of ML in a way that I'll really create a value

by IU Dec 6, 2021

I have been involved with deep learning for more than 5 years (in academia), nevertheless learned a lot already. I am very curious about the next courses. Thanks for putting together this course!

by EE May 20, 2021

Excellent course, as always! Many thanks! Great combination of theory + notebooks with practical examples.\nEverything is perfectly structured. I will recommend this course to everyone!

by AC Jun 9, 2021

I have been working in a large payments technology company for last one year and I can vouch for all the processes Andrew beautifully summarised. It does help a lot working in the industry.

[View all reviews](#)

About the Machine Learning Engineering for Production (MLOps) Specialization

Understanding machine learning and deep learning concepts is essential, but if you're looking to build an effective AI career, you need production engineering capabilities as well.

Effectively deploying machine learning models requires competencies more commonly found in technical fields such as software engineering and DevOps. Machine learning engineering for production combines

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