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Course Info**Taught by:** Andrew Ng, CEO/Founder Landing AI; Co-founder, Coursera; Adjunct Professor, Stanford University; formerly Chief Scientist, Baidu and founding lead of Google Brain**About this Course**

Machine learning is the science of getting computers to act without being explicitly programmed. In the past decade, machine learning has given us self-driving cars, practical speech recognition, effective web search, and a vastly improved understanding of the human genome. Machine learning is so pervasive today that you probably use it dozens of times a day without knowing it. Many researchers also think it is the best way to make

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	Language
	English, Subtitles: Chinese (Simplified), Hebrew, Spanish, Hindi, Japanese Volunteer to translate subtitles for this course
	How To Pass
	Pass all graded assignments to complete the course.

	User Ratings
	Average User Rating 4.9

Syllabus**WEEK 1****Introduction**

Welcome to Machine Learning! In this module, we introduce the core idea of teaching a computer to learn concepts using data—without being explicitly programmed. The Course Wiki is under construction. Please visit the resources tab for the most complete and up-to-date information.

 5 videos, 9 readings [expand](#) **Graded:** Introduction**Linear Regression with One Variable**

Linear regression predicts a real-valued output based on an input value. We discuss the application of linear regression to housing price prediction, present the notion of a cost function, and introduce the gradient descent method for learning.

 7 videos, 8 readings [expand](#) **Graded:** Linear Regression with One Variable**Linear Algebra Review**

This optional module provides a refresher on linear algebra concepts. Basic understanding of linear algebra is necessary for the rest of the course, especially as we begin to cover models with multiple variables.

 6 videos, 7 readings, 1 practice quiz [expand](#)**WEEK 2****Linear Regression with Multiple Variables**

What if your input has more than one value? In this module, we show how linear regression can be extended to accommodate multiple input features. We also discuss best practices for implementing linear regression.

 8 videos, 16 readings [expand](#) **Graded:** Linear Regression with Multiple Variables**Octave/Matlab Tutorial**

This course includes programming assignments designed to help you understand how to implement the learning algorithms in practice. To complete the programming assignments, you will need to use Octave or MATLAB. This module introduces Octave/Matlab and shows you how to submit an assignment.

 6 videos, 1 reading [expand](#) **Graded:** Octave/Matlab Tutorial

WEEK 3

Logistic Regression

Logistic regression is a method for classifying data into discrete outcomes. For example, we might use logistic regression to classify an email as spam or not spam. In this module, we introduce the notion of classification, the cost function for logistic regression, and the application of logistic regression to multi-class classification.

 7 videos, 8 readings [expand](#)

 **Graded:** Logistic Regression

Regularization

Machine learning models need to generalize well to new examples that the model has not seen in practice. In this module, we introduce regularization, which helps prevent models from overfitting the training data.

 4 videos, 5 readings [expand](#)

 **Graded:** Regularization

WEEK 4

Neural Networks: Representation

Neural networks is a model inspired by how the brain works. It is widely used today in many applications: when your phone interprets and understand your voice commands, it is likely that a neural network is helping to understand your speech; when you cash a check, the machines that automatically read the digits also use neural networks.

 7 videos, 6 readings [expand](#)

 **Graded:** Neural Networks: Representation

WEEK 5

Neural Networks: Learning

In this module, we introduce the backpropagation algorithm that is used to help learn parameters for a neural network. At the end of this module, you will be implementing your own neural network for digit recognition.

 8 videos, 8 readings [expand](#)

 **Graded:** Neural Networks: Learning

WEEK 6

Advice for Applying Machine Learning

Applying machine learning in practice is not always straightforward. In this module, we share best practices for applying machine learning in practice, and discuss the best ways to evaluate performance of the learned models.

 7 videos, 7 readings [expand](#)

 **Graded:** Advice for Applying Machine Learning

Machine Learning System Design

To optimize a machine learning algorithm, you'll need to first understand where the biggest improvements can be made. In this module, we discuss how to understand the performance of a machine learning system with multiple parts, and also how to deal with skewed data.

 5 videos, 3 readings [expand](#)

 **Graded:** Machine Learning System Design

WEEK 7

Support Vector Machines

Support vector machines, or SVMs, is a machine learning algorithm for classification. We introduce the idea and intuitions behind SVMs and discuss how to use it in practice.

 6 videos, 1 reading [expand](#)

 **Graded:** Support Vector Machines

WEEK 8

Unsupervised Learning

We use unsupervised learning to build models that help us understand our data better. We discuss the k-Means algorithm for clustering that enable us to learn groupings of unlabeled data points.

 5 videos, 1 reading [expand](#)

 **Graded:** Unsupervised Learning

Dimensionality Reduction

In this module, we introduce Principal Components Analysis, and show how it can be used for data compression to speed up learning algorithms as well as for visualizations of complex datasets.

 7 videos, 1 reading [expand](#)

 **Graded:** Principal Component Analysis

WEEK 9

Anomaly Detection

Given a large number of data points, we may sometimes want to figure out which ones vary significantly from the average. For example, in manufacturing, we may want to detect defects or anomalies. We show how a dataset can be modeled using a Gaussian distribution, and how the model can be used for anomaly detection.

 8 videos, 1 reading [expand](#)

 **Graded:** Anomaly Detection

Recommender Systems

When you buy a product online, most websites automatically recommend other products that you may like. Recommender systems look at patterns of activities between different users and different products to produce these recommendations. In this module, we introduce recommender algorithms such as the collaborative filtering algorithm and low-rank matrix factorization.

 6 videos, 1 reading [expand](#)

 **Graded:** Recommender Systems

WEEK 10

Large Scale Machine Learning

Machine learning works best when there is an abundance of data to leverage for training. In this module, we discuss how to apply the machine learning algorithms with large datasets.

 6 videos, 1 reading [expand](#)

 **Graded:** Large Scale Machine Learning

WEEK 11

Application Example: Photo OCR

Identifying and recognizing objects, words, and digits in an image is a challenging task. We discuss how a pipeline can be built to tackle this problem and how to analyze and improve the performance of such a system.

 5 videos, 1 reading [expand](#)

 **Graded:** Application: Photo OCR

[View Less](#)

How It Works

GENERAL

How do I pass the course?

To earn your Course Certificate, you'll need to earn a passing grade on each of the required assignments—these can be quizzes, peer-graded assignments, or programming assignments. Videos, readings, and practice exercises are there to help you prepare for the graded

[▼ More](#)

PROGRAMMING ASSIGNMENTS

Programming assignments require you to write and run a computer program to solve a problem.

What are programming assignments?

[▼ More](#)

[View the course in catalog](#)

Related Courses



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