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Neural Networks and Deep Learning

About this course: If you want to break into cutting-edge AI, this course will help you do so. Deep learning engineers are highly sought after, and mastering deep learning will give you numerous new career opportunities. Deep learning is also a new "superpower" that will let you build AI systems that just weren't possible a few years ago.

In this course, you will learn the foundations of deep learning. When you finish this class, you will:
- Understand the major technology trends driving Deep Learning
- Be able to build, train and apply fully connected deep neural networks
- Know how to implement efficient (vectorized) neural networks
- Understand the key parameters in a neural network's architecture

This course also teaches you how Deep Learning actually works, rather than presenting only a cursory or surface-level description. So after completing it, you will be able to apply deep learning to a your own applications. If you are looking for a job in AI, after this course you will also be able to answer basic interview questions.

This is the first course of the Deep Learning Specialization.

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Who is this class for: Prerequisites: Expected: - Programming: Basic Python programming skills, with the capability to work effectively with data structures. Recommended: - Mathematics: Matrix vector operations and notation. - Machine Learning: Understanding how to frame a machine learning problem, including how data is represented will be beneficial. If you have taken my Machine Learning Course here, you have much more than the needed level of knowledge.

Created by: deeplearning.ai

Taught by: Andrew Ng, Co-founder, Coursera; Adjunct Professor, Stanford University; formerly head of Baidu AI Group/Google Brain

Taught by: Head Teaching Assistant - Kian Katanforoosh, Adjunct Lecturer at Stanford University, deeplearning.ai, Ecole Centrale Paris

Taught by: Teaching Assistant - Younes Bensouda Mourri, Mathematical & Computational Sciences, Stanford University, deeplearning.ai

Basic Info	Course 1 of 5 in the Deep Learning Specialization
Level	Intermediate

Commitment	4 weeks of study, 3-6 hours a week
Language	English, **Subtitles:** Portuguese (Brazilian), Chinese (Traditional), Chinese (Simplified)
How To Pass	Pass all graded assignments to complete the course.
User Ratings	★★★★½ Average User Rating 4.9 See what learners said

Course 1 of Specialization

Deep Learning Specialization
Master Deep Learning, and Break into AI

Deep Learning
deeplearning.ai

Learn More

Syllabus

WEEK 1

Introduction to deep learning

Be able to explain the major trends driving the rise of deep learning, and understand where and how it is applied today.

7 videos, 2 readings

1. **Video:** Welcome
2. **Video:** What is a neural network?
3. **Video:** Supervised Learning with Neural Networks
4. **Video:** Why is Deep Learning taking off?
5. **Video:** About this Course
6. **Reading:** Frequently Asked Questions
7. **Video:** Course Resources
8. **Reading:** How to use Discussion Forums
9. **Video:** Geoffrey Hinton interview

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Graded: Introduction to deep learning

WEEK 2

Neural Networks Basics

Learn to set up a machine learning problem with a neural network mindset. Learn to use vectorization to speed up your models.

19 videos, 2 readings

1. **Video:** Binary Classification

2. **Video:** Logistic Regression
3. **Video:** Logistic Regression Cost Function
4. **Video:** Gradient Descent
5. **Video:** Derivatives
6. **Video:** More Derivative Examples
7. **Video:** Computation graph
8. **Video:** Derivatives with a Computation Graph
9. **Video:** Logistic Regression Gradient Descent
10. **Video:** Gradient Descent on m Examples
11. **Video:** Vectorization
12. **Video:** More Vectorization Examples
13. **Video:** Vectorizing Logistic Regression
14. **Video:** Vectorizing Logistic Regression's Gradient Output
15. **Video:** Broadcasting in Python
16. **Video:** A note on python/numpy vectors
17. **Video:** Quick tour of Jupyter/iPython Notebooks
18. **Video:** Explanation of logistic regression cost function (optional)
19. **Reading:** Deep Learning Honor Code
20. **Reading:** Programming Assignment FAQ
21. **Notebook:** Python Basics with numpy (optional)
22. **Ungraded Programming:** Python Basics with numpy (optional)
23. **Notebook:** Logistic Regression with a Neural Network mindset
24. **Video:** Pieter Abbeel interview

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Graded: Neural Network Basics

Graded: Logistic Regression with a Neural Network mindset

WEEK 3

Shallow neural networks

Learn to build a neural network with one hidden layer, using forward propagation and backpropagation.

12 videos

1. **Video:** Neural Networks Overview
2. **Video:** Neural Network Representation
3. **Video:** Computing a Neural Network's Output
4. **Video:** Vectorizing across multiple examples
5. **Video:** Explanation for Vectorized Implementation
6. **Video:** Activation functions
7. **Video:** Why do you need non-linear activation functions?
8. **Video:** Derivatives of activation functions
9. **Video:** Gradient descent for Neural Networks
10. **Video:** Backpropagation intuition (optional)
11. **Video:** Random Initialization
12. **Notebook:** Planar data classification with a hidden layer
13. **Video:** Ian Goodfellow interview

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Graded: Shallow Neural Networks

Graded: Planar data classification with a hidden layer

WEEK 4

Deep Neural Networks

Understand the key computations underlying deep learning, use them to build and train deep neural networks, and apply it to computer vision.

8 videos

1. **Video:** Deep L-layer neural network
2. **Video:** Forward Propagation in a Deep Network
3. **Video:** Getting your matrix dimensions right
4. **Video:** Why deep representations?
5. **Video:** Building blocks of deep neural networks
6. **Video:** Forward and Backward Propagation
7. **Video:** Parameters vs Hyperparameters
8. **Video:** What does this have to do with the brain?
9. **Notebook:** Building your Deep Neural Network: Step by Step
10. **Notebook:** Deep Neural Network - Application

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Graded: Key concepts on Deep Neural Networks

Graded: Building your deep neural network: Step by Step

Graded: Deep Neural Network Application

View Less

FAQs

- When will I have access to the lectures and assignments?
- What will I get if I pay for this course?
- Can I take this course for free?
- What is the refund policy?
- Is financial aid available?

How It Works

Coursework

Each course is like an interactive textbook, featuring pre-recorded videos, quizzes and projects.

Help from Your Peers

Connect with thousands of other learners and debate ideas, discuss course material, and get help mastering concepts.

Certificates

Earn official recognition for your work, and share your success with friends, colleagues, and employers.

Creators

deeplearning.ai

deeplearning.ai is Andrew Ng's new venture which amongst others, strives for providing comprehensive AI education beyond borders.

Ratings and Reviews

★★★★½ Rated 4.9 out of 5 of 24,561 ratings

JS	Really enjoyed this course! The assignments really helped to solidify the concepts and were fun.	★★★★★
W	a great course	★★★★★
	Excellent intro to deep learning if you have a basic background in machine learning, especially in Logistic Regression. Wish the math was explained more in depth but I understand that it was kept simple for the wider audience. Highly recommended.	★★★★☆
DZ	excellent	★★★★★

See all 5,232 reviews

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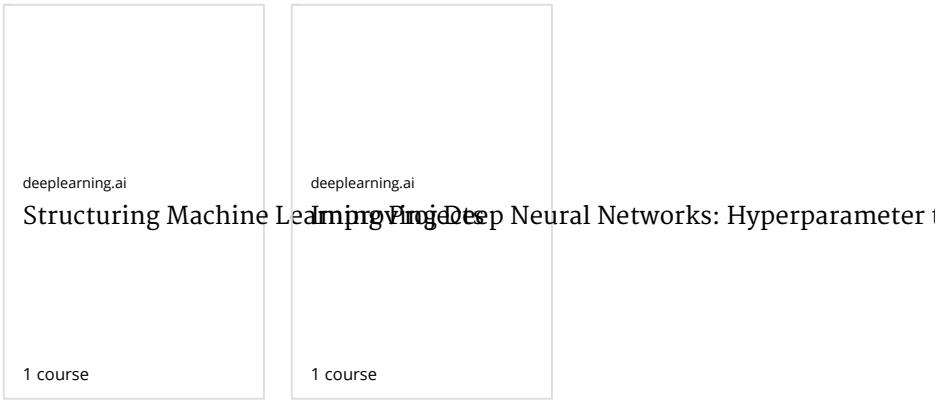

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