# Artificial Intelligence with TensorFlow

*Drive your data further*

**Artificial Intelligence with TensorFlow** is a three-week, part-time, online bootcamp that offers an advanced look at what neural networks, deep learning, machine learning and artificial intelligence are and what they can do for businesses. This immersive, hands-on course teaches students the data science tools and technologies needed to build and test neural networks in TensorFlow using real-world data. The work learned in this course can be applied to businesses to help attendees reduce operational costs, grow revenue, increase efficiency and improve customer experience.

## Who should attend?

Data analysts, economists, researchers, software, data engineers or data managers who want to deepen their understanding of artificial intelligence and neural networks

## Key Concepts Covered

TensorFlow, iterative algorithms, neural networks, overfitting, adversarial noise, variational autoencoders, estimators, datasets

## Prerequisites

To achieve the greatest benefit from this course, attendees must take *Essential Data Tools* and *Practical Machine Learning* or possess the following skills prior to attending:

- Intermediate Python
- Linear algebra
- Statistical modeling

Register for *AI with TensorFlow* or learn more about other courses in our data curriculum by visiting **pragmaticinstitute.com** or calling **480.515.1411**.

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## What Students Learn

Over the course of three weeks, attendees get hands-on experience with TensorFlow and utilize real-world data to gain skills that can be used the next day.

**PRAGMATIC DATA CERTIFIED**

*Attendees earn a coveted data science certification upon successful completion of class project*

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**WEEK 1**

**STUDENTS ARE INTRODUCED TO TENSORFLOW**, begin building simple iterative algorithms and practice multiple types of programs and tools.

- Introduction to TensorFlow
  - The computational graph
  - Exercise: implementing a basic graph
  - Tensor: data types and shapes
  - Exercise: reducing tensors of arbitrary shape
  - Graphs, sessions, TensorBoard

- Iterative algorithms
  - Archimedes' algorithm
  - Exercise: Fibonacci numbers
  - Newton's method of root finding
  - Exercise: minimizing functions of two variables

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**WEEK 2**

**STUDENTS BEGIN ASSEMBLING NEURAL NETWORKS** out of linear models, and basic networks are expanded into deep networks.

- Basic neural networks
  - The XOR problem
  - Hidden layers
  - Exercise: number of hidden neurons
  - Activation functions
  - Exercise: exploring activation functions
  - Exercise: adding a hidden layer

- Deep neural networks
  - What is deep learning?
  - Multilayer perceptron
  - Layer API
  - Overfitting and dropout
  - Exercise: adding flexibility
  - Exercise: adding dropout
  - Exercise: changing the learning rate

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**WEEK 3**

**STUDENTS LEARN A NUMBER OF TOPICS** related to convolutional networks, variational autoencoders and recurrent architecture for neural networks.

- Convolutional networks
  - Exercise: improving network architecture

- Adversarial noise
  - How do you find adversarial noise?
  - Putting it all together
  - Exercise: extending immunity

- DeepDream and the inception model variational autoencoders
  - Autoencoders
  - Encoder and decoder
  - KL-divergence
  - Adam optimizer
  - Exercise: the influence of loss functions

- Recurrent neural networks
  - Backpropagation through time
  - Long-short term memory
  - Generating strata abstracts

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