

Stanford University's 'Machine Learning' Coursera course, taught by Andrew Ng
<https://www.coursera.org/learn/machine-learning>

Level: Beginner

Language: MATLAB or Octave

Cost: Free to audit (USD\$80 to obtain certificate)

Outline: This course provides a broad introduction to machine learning, datamining, and statistical pattern recognition. Topics include: (i) Supervised learning (parametric/non-parametric algorithms, support vector machines, kernels, neural networks). (ii) Unsupervised learning (clustering, dimensionality reduction, recommender systems, deep learning). (iii) Best practices in machine learning (bias/variance theory; innovation process in machine learning and AI). The course will also draw from numerous case studies and applications.

Prerequisites before taking the course?

Some programming experience and a background in statistical methods. Programming assignments are in Octave (a freeware version of MATLAB).

Time commitment

11 weeks – each week requires circa 3 to 5 hours. Would recommend completing the programming assignments to get the full benefit of the course.

What data science content is in the course?

I completed the original version of this course, I think it has now been revamped into a second version that has an even stronger focus on neural networks.

Mix of lecture videos, notes, multiple choice questions and programming assignments.

Supervised vs. unsupervised learning; cost functions; Gradient descent; linear algebra; linear programming; classification; decision boundaries, logistic regression; regularization; overfitting; neural networks and the backpropagation algorithm; gradient checking; random initialization; train/test/cross validation; bias and variance; error analysis; precision and recall; Support Vector Machines; K-Means; Principal Component Analysis; Examples: OCR, self-driving vehicles, anomaly detection, recommender systems.

Who would the course be suitable for?

I believe it would be highly suitable for most actuaries, students and fellows. The hands-on programming requirements of this course will mean that not every actuary will want to work on the assignments, but those who are prepared to get stuck into it will get a lot out of it.

What worked well in the course?

Very good pace of teaching, clearly explained, and with a practical focus on how to build machine learning solutions (neural networks and others) from scratch to solve real world problems.

What could be improved in the course?

Use of Python rather than Octave.
