Instructor: Andrew Ng
Teaching Assistant: Younes Bensouda Mourri

Course Description: You will learn to implement and apply machine learning algorithms. This course emphasizes practical skills, and focuses on giving you skills to make these algorithms work. You will learn about commonly used learning techniques including supervised learning algorithms (logistic regression, linear regression, SVM, neural networks/deep learning), unsupervised learning algorithms (k-means), as well as learn about specific applications such as anomaly detection and building recommender systems. This class is taught in the flipped-classroom format. You will watch videos and complete in-depth programming assignments and online quizzes at home, then come to class for discussion sections. This class will culminate in an open-ended final project, which the teaching team will help you on.

Prerequisites: Programming at the level of CS106B or 106X, and basic linear algebra such as Math 51.

Grade Breakdown:
- Homeworks: 45%
- Quizzes: 10%
- Attendance: 5% (you are allowed to miss one class)
- Project: 40%

Final Project Presentation: June 13th, 2018

Office hours (Huang Basement):
- Monday: 11:30 - 12:30 pm
- Thursday: 3:00 - 5:00 pm
- Friday: 11:30 - 1:00 pm

Session 1: Tuesday, April 3rd, 2018

Content: Overview of machine learning and models

Homework: Week 1 & 2 on Coursera for next class. (Due at 4:30 PM Tuesday, April 10, 2018):
- Quizzes: Introduction, Linear regression with one variable, Linear algebra, Linear regression with multiple variables, Octave/Matlab tutorial.
- Programming Assignments: Linear regression (both assignments)

Session 2: Tuesday, April 10th, 2018
Content: Linear regression
Homework: Week 3 on Coursera for next class. (Due at 4:30 PM Tuesday, April 17th, 2018):
  ● Quizzes: Logistic regression, Regularization
  ● Programming Assignments: Logistic regression

Session 3: Tuesday, April 17th, 2018

Content: Logistic regression and Regularization
Homework: Weeks 4, 5 on Coursera for next class. (Due at 4:30 PM Tuesday, April 24th, 2018):
  ● Quizzes: Neural networks, Neural networks: learning
  ● Programming Assignments: Multi class classification and neural networks, Neural network learning

Session 4: Tuesday, April 24th, 2018

Content: Neural networks
Homework: Weeks 6 on Coursera for next class. (Due at 4:30 PM Tuesday, May 1, 2018):
  ● Quizzes: Advice for applying machine learning, Machine learning system design
  ● Programming Assignments: Regularized linear regression and bias/variance

Session 5: Tuesday, May 1, 2018

Content: Bias/Variance, Advice on ML systems
Homework: Weeks 7, 8 on Coursera for next class. (Due at 4:30 PM Tuesday, May 8, 2018):
  ● Quizzes: Support Vector Machines, Unsupervised learning, Principal Component Analysis
  ● Programming Assignments: Support Vector Machines, K-means clustering and PCA.

Session 6: Tuesday, May 8, 2018

Content: Support Vector Machines, Principal Component Analysis, K-Means Clustering
Homework: Week 9 on Coursera for next class. (Due at 4:30 PM Tuesday, May 15th):
  ● Quizzes: Anomaly Detection, Recommender Systems
  ● Programming Assignments: Anomaly Detection, Recommender Systems
Session 7: Tuesday, May 15th, 2018 (might switch this with session 9)

Content: Anomaly Detection, Recommender Systems
Homework: Week 10,11 on Coursera for next class. (Due at 4:30 PM Tuesday, May 22nd):
  - Quizzes: Large scale machine learning, application photo OCR
  - Project Milestone: Write up. Follow the guidelines in the worksheet.

Session 8: Tuesday, May 22nd, 2018

Content: When to use what algorithm? Given a situation, choose a model.
Homework: Work on final Project

Session 9: Tuesday, May 29th, 2018

Content: How to read a paper?
Homework: Work on final Project

Session 10: Tuesday, June 5th, 2018
Content: Career Advice
Homework: Work on final Project

Final Project Presentation: June 13th, 2018