# CS 229
# Machine Learning
# Handout #2: Tentative Course Schedule

## Syllabus

- **Introduction** (1 class) Basic concepts.

- **Supervised learning.** (6 classes) Supervised learning setup. LMS.
  Logistic regression. Perceptron. Exponential family.
  Generative learning algorithms. Gaussian discriminant analysis. Naive Bayes.
  Support vector machines.
  Model selection and feature selection.
  Ensemble methods: Bagging, boosting, ECOC.

- **Learning theory.** (3 classes) Bias/variance tradeoff. Union and Chernoff/Hoeffding bounds.
  VC dimension. Worst case (online) learning.
  Advice on using learning algorithms.

- **Unsupervised learning.** (5 classes) Clustering. K-means.
  EM. Mixture of Gaussians.
  Factor analysis.
  PCA. MDS. pPCA.
  Independent components analysis (ICA).

- **Reinforcement learning and control.** (4 classes) MDPs. Bellman equations.
  Value iteration. Policy iteration.
  Linear quadratic regulation (LQR). LQG.
  Q-learning. Value function approximation.
  Policy search. Reinforce. POMDPs.

## Dates for assignments

- Assignment 1: Out 10/3. Due 10/17.
- Assignment 2: Out 10/17. Due 10/31.
- Assignment 3: Out 10/31. Due 11/14.
- Assignment 4: Out 11/14. Due 12/3.
- Term project: Proposals due 10/19. Milestone due 11/16. Poster presentations on 12/12; final writeup due on 12/14 (no late days).