

# ISyE 6740 - Spring 2018

## Tentative Teaching Schedule

Lecture #	Date	Topic	Textbook Reference
		<u>Introduction</u>	
0	Jan 10, 12	Introduction and overview	
		<u>Unsupervised learning</u>	
1	Jan 19	Review of basics	Guest lecture
2	Jan 22,24	Clustering, k-means algorithms, and Hierarchical clustering	ESL: 14.3
3	Jan 24,26	Spectral clustering algorithms	ESL: 14.5.3
4	Jan 29	Dimensionality reduction, PCA, bag-of-words model	ESL: 14.5
5	Jan 31	Nonlinear dimensionality reduction, Isomap	ESL: 14.9
6	Feb 2, 5	Density estimation	ESL: 6.6
7	Feb 7, 9	Gaussian mixture model (GMM) and EM algorithm	ESL 6.9, 8.5, PRML 9
	Feb 12	Midterm 1 review	Chapters 2 to 7
<b>MT1</b>	<b>Feb 14</b>	<b>Midterm 1</b>	
		<u>Supervised learning</u>	
8	Feb 16	Classification: Naïve Bayes	ESL 4
9	Feb 19	Logistic regression	ESL 4.4
10	Feb 21	Support Vector Machine (SVM)	ESL 12
11	Feb 23	Basic optimization theory	
12	Feb 26,28, March 2	Neural networks	PRML 5
13	March 5,7	Boosting algorithms, AdaBoost	ESL 10
14	March 9,12	Regression and random forrest	PRML 3, ESL 15
	March 14	Midterm 2 review	Chapters 2 to 7
<b>MT2</b>	<b>March 16</b>	<b>Midterm 2</b>	
Spring Break	March 19-23		
		<u>Data-mining techniques</u>	
15	March 26	Feature selection and mutual information	
16	March 28,30	Bias-variance tradeoff and cross validation (CV)	ESL 7
		<u>Advanced topics</u>	
17	April 2,4	Collaborative filtering and recommender systems	

18	April 4,6	Kernel methods	PRML 6
19	April 9,11,13	Sequence data, Hidden Markov Model (HMM), and Kalman filter	PRML 13
20	April 16,18,20	Markov random fields and graphical model	PRML 8
	April 23	Final Review	
<b>Final</b>	<b>May 2</b>	<b>Final Exam</b>	8:00-10:50am

Tentative homework schedule:

- Homework 1 due Jan 30
- Homework 2 due Feb 10
- Homework 3 due Feb 26
- Homework 4 due March 26
- Homework 5 due April 18