Department of Mathematics & Statistics
Concordia University

STAT 497 (MACF 491/MAST 679/MAST 881), Sec. H

Topics in Statistics & Probability
Topic: Statistical Learning
Winter 2018

Instructor: Dr. F. Godin, Office: LB 921-05 (SGW), Phone: (514) 848-2424, Ext. 3494
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Office Hours: Monday and Wednesday, 15:00-16:00

Class Schedule: Monday and Wednesday, 16:15-17:30, room Hall 521, SGW campus.

Texts: *The elements of statistical learning*, by J. Friedman, T. Hastie and R. Tibshirani, Springer series in statistics. Available for free online at http://www-bcf.usc.edu/~gareth/ISL/

An introduction to statistical learning, by G. James, D Witten, T. Hastie and R. Tibshirani, Springer. Available for free online at https://web.stanford.edu/~hastie/ElemStatLearn/

Outline: This course is an introduction to statistical learning techniques. Some applications to finance and insurance will be illustrated. Topics covered include:

- Cross-validation
- Regression methods
  - Linear models
  - Variable selection methods
  - Shrinkage methods: Ridge regression and LASSO
  - Generalized linear models
- Classification methods
  - K-nearest neighbors
  - Linear and quadratic discriminants
  - Logistic regression
- Tree-Based Methods
- An introduction to neural networks
- Unsupervised learning
  - Clustering: K-means, hierarchical clustering
  - Principal component analysis
- Markov decision problems and dynamic programming

Evaluation: The course mark will be determined by a mid-term (35% weight), assignments (30% weight) and a project (35% weight).