



Students requiring accommodations as a result of disability must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

Instructor: [Dr. Jiguo Cao](#)

Prerequisite:

STAT 830 and STAT 853 or permission of the instructor

Textbook:

The Elements of Statistical Learning: Data Mining, Inference, and Prediction (2nd ed.) by Trevor Hastie, Robert Tibshirani, Jerome Friedman. Publisher: Springer

Calendar Description:

An advanced treatment of modern methods of multivariate statistics and non-parametric regression. Topics may include: (1) dimension reduction techniques such as principal component analysis, multidimensional scaling and related extensions; (2) classification and clustering methods; (3) modern regression techniques such as generalized additive models, Gaussian process regression and splines.

Course Outline:

1. Problems with high dimensions,
2. Variable selection: stepwise, shrinkage, LASSO, and penalized likelihood
3. Modern regression techniques: Splines, trees, generalized additive models
4. Dimension reduction techniques: Principal components and multidimensional scaling
5. Classification and clustering methods,
6. Ensemble learning methods.

Grading Scheme:

Assignments 50%

Projects 50%

Grading is subject to change.

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Students are encouraged to review policies pertaining to academic integrity available on Student Services webpage at <http://students.sfu.ca/academicintegrity.html>

Revised June 26, 2013