

STAT*6801

Statistical Learning Fall 2015

Instructor: A. F. Desmond email: tdesmond@uoguelph.ca phone: 52293

Office: MCN 523

Lectures: M+W: 4:00 – 5:20 pm

Course Texts: *Extending the Linear Model with R*, by Julian Faraway. Chapman and Hall 2006.

An Introduction to Statistical Learning with R, by James et al, Springer 2014.

Modern Applied Statistics with S, 4th Edition, by W.N. Venables and B.D. Ripley. Springer 2004.

The Elements of Statistical Learning: Data Mining, Inference and Prediction, by Hastie, Tibshirani, and Friedman. Springer 2009 2nd Edition.

Statistical Learning from a Regression Perspective, by Berk, R. Springer 2008.

Generalized Additive Models, by Hastie and Tibshirani, Chapman and Hall, 1990.

Semiparametric Regression, by Ruppert, Wand and Carroll, Cambridge University Press 2003.

Course Description: This course will deal with a variety of topics in statistical learning and their implementation in R. In lectures I will briefly review recent research in generalized linear models. One focus of the course will be nonparametric and semiparametric versions of these models. One example is generalized additive models (GAMs) which will be treated in some depth. In addition modern nonparametric regression via kernels, splines, etc. will be studied. Other topics which will be covered include: classification and regression trees and neural networks. Time permitting, topics such as wavelets and MARS (Multivariate Adaptive Regression Splines) may also be treated. In the project component of the course the student is encouraged to work in areas (both applied and theoretical), of his or her own interest, with the instructor's permission. Much of the material in the required and recommended texts relates to research published in the last two decades or so. Areas of application include medicine, finance, agriculture, economics, pharmacokinetics, bioassay, engineering reliability, to name only a few. Familiarity with R will be assumed. The best way to acquire familiarity is via the manuals (available on line). Also simply working through the required texts is of great value.

Grading: Assignments: 50% Term Project : 50%

