COURSE AND CONTACT INFORMATION

Course: STAT 6242  
Semester: SPRING 2015

INSTRUCTOR

Name: Dr. Tatiyana (Tanya) V Apanasovich,  
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Office hours: W 4:00-6:00 or by appointment

COURSE DESCRIPTION

This course aims to train you to use advanced statistical methods for analyzing data. We start with the linear model and build on the theory and applications that you've already seen in this setting in order to explore richer model classes, more kinds of data, and more complex setups. Here is an outline of the course material.

- Linear regression. Univariate and multivariate linear regression. The assumptions underlying linear regression, and the corresponding optimality properties (best linear unbiased estimate) and inferential properties. Weighted linear regression.


- Parametric vs nonparametric Regression. Kernel regression. Smoothing splines


COURSE PREREQUISITE(S)

STAT 2118 (Regression Methods) or a similar course that covers analysis of research data through simple and multiple regression and correlation. Basics on probability, expectation, and conditional distributions. Matrix algebra and multivariate calculus will
be beneficial but is not required. The examples in the course use R and students will do weekly R Labs to apply statistical learning methods to real-world data. Extensive guidance in using R will be provided. Introductions to R are available at http://cran.r-project.org/doc/manuals/R-intro.html.

TEXTS

The course material will be based on notes prepared by the instructor supported by the reference
An Introduction to Statistical Learning, with applications in R (2013), G. James, D. Witten, T. Hastie, R. Tibshirani (Springer).

OBJECTIVES

Upon completing this course, you should be able to tackle new regression problems, by: (1) selecting the appropriate methods and justifying your choices; (2) implementing these methods programmatically using R programming language and evaluating your results; (3) explaining your results to a researcher outside of statistics.

GRADING

Your final grade will be a weighted average of your homework average (15%), in-class exam (40%), and take home project (45%).

CLASS POLICIES

**Homework:** There will be 7-9 homework assignments, with greater frequency in the first half of the course. Some assignments will be more analytical, others will deal with data analysis and implementation of procedures in R. Assignments must be completed by students individually, but group discussion is permitted. The due time will be 11:59pm of the due date (usually class date). You have to use Dropbox to submit the homeworks. No late homework will be accepted, but the lowest score will be dropped

**Midterm Exam:** One open–book in-class examination will be given on April, 1. Make-up midterm will be given only in exceptional circumstances (e.g. well-documented medical problems).

**Take Home Project:** Take Home Project is a group project with three deliverables:
A proposal for the project- one page long (Due Wed, 18, 2014)
An in class presentation (Due Wed April 15, 2014)
A report to be handed in (Due Wed April, 22, 2014)
ACADEMIC INTEGRITY
I personally support the GW Code of Academic Integrity. It states:: “Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information.” For the remainder of the code, see: http://www.gwu.edu/~ntegrity/code.html

SUPPORT FOR STUDENTS OUTSIDE THE CLASSROOM
DISABILITY SUPPORT SERVICES (DSS)
Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: http://gwired.gwu.edu/dss/

UNIVERSITY COUNSELING CENTER (UCC)  202-994-5300
The University Counseling Center (UCC) offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include:
- crisis and emergency mental health consultations
- confidential assessment, counseling services (individual and small group), and referrals
  http://gwired.gwu.edu/counsel/CounselingServices/AcademicSupportServices

SECURITY
In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.