Math 410A, Winter 2019
Advanced Statistical Methods

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Office Hours: Monday 9–10, Tuesday 11–12, Thursday 9–10, Friday 11–12, and by appointment

Meeting times:
Monday, Thursday, 12:00 – 12:50 in Samuelson 108
Tuesday, Friday, 10:00 – 10:50 in Samuelson 138 (unless otherwise announced)

Course Goals and Description: This course is the first of a two-part sequence designed to cover beginning and intermediate regression, ANOVA, and non-parametric statistical models. We will learn the theory behind these models, and we will spend a lot of time using them to answer questions about real-world data. Topics will likely include: linear regression, multiple regression, logistic regression, inference from regression, and ANOVA.

The first half of the course (410A) will include some very basic ANOVA, a lot of more advanced details about regression, and an introduction to R. The second half (410B) will include many details about ANOVA, non-parametric statistics, and modern permutation and bootstrap methods. This part of the course will include a significant component on presenting statistics in public.

We will begin a significant project during the winter term in which we provie data analysis for a business or government partner. A significant part of your work in this class will revolve on this analysis, and on your ability to share the data (in written and oral format) with our partner.

Required Text: Gareth James, et al. *An Introduction to Statistical Learning with Applications in R*, Springer.

Evaluation and Grading: Grades will consist of four components: (almost) weekly labs (20%), homework (10%), two midterm exams (20% each), and a large quarter-long project (30%) in which you will complete and write about a significant statistical analysis of your own or with your team. This may serve as a prelude to a larger project you will complete in Math 410B.

Grades will be assigned according to the following scale:

		A	93-100%	A- 90-92.99%
B+	87-89.99%	B	83-86.99%	B- 80-82.99%
C+	77-79.99%	C	73-76.99%	C- 70-72.99%
D+	67-69.99%	D	63-66.99%	D- 60-62.99%
		F	59.99% and below	

Details concerning course components

"R skills" labs

The course will feature two or three labs which introduce you to, and let you practice, sets of specific advanced skills in R.

Each of these labs will contain a short introduction, a reference to one or more resources for mastering the technique, and a set of challenges for you to complete.

Homework

A small amount of homework will be assigned from the book most weeks. These are designed to let you practice the basics of the new statistics we are covering, and the corresponding techniques in R. Homework will generally not be collected.

Midterm Exams

There will be two take-home mid-term exams, given roughly during Week 5 and Week 9. During this time you may use any sources you like except for other people.

General Course Policies: Come to class. Do your own work. Work really hard; this class is likely to be quite difficult, but you will leave it with a useful set of skills, and a better understanding of statistics!

Students with disabilities who wish to set up academic adjustments in this class should give me a copy of their "Confirmation of Eligibility for Academic Adjustments" from the Center for Disability Services as soon as possible so we can discuss how the approved adjustments will be implemented in class. Students without this form should contact the Center for Disability Services, Bouillon 205 or dssrecept@cwu.edu or 963-2171.

I reserve the right to change the policies contained in this syllabus as dictated by developments during the quarter.