Math 410B Spring 2017
Advanced Statistical Methods II

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Office Hours: MW 2 - 2:50 PM, TTh 11 - 11:50 AM, and by appointment.

Course Goals: This course is the second 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, and ANOVA. The first half of the course (410A) will introduce some very basic ANOVA, a lot of the more advanced details about regression, and the statistical software R. We will begin a significant project during winter term. The second half (410B) will include many details about ANOVA, non-parametric statistics, and will have a significant project component. Besides statistical content, a major goal for the sequence is to focus on statistical communication. We'll spend some time with written statistical communication in winter quarter, and add in oral statistical communication in spring quarter.

Required Text: Ann R. Cannon, et. al. *STAT 2: Building Models for a World of Data*, W.H. Freeman.

Evaluation and Grading: Grades will consist of the following components: approximately bi-weekly labs (15%), homework (15%), two take-home exams (20% each), a public speaking component (15%) and a quarter-long project (15%) in which you will complete and write about a significant statistical analysis of your (possibly plural) own.
A tentative plan for the course schedule follows the syllabus. Please note that this is extremely tentative!
Grades will be assigned according to the following scale:

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

General Course Policies: Daily attendance is expected and considered necessary for success. It is your responsibility to find out what was covered on days you were absent. You are responsible for any announcements made in class regarding homework, exams, and labs. Handouts from class and homework assignments will be posted on Canvas.

All work handed in for the course must be written neatly, legibly, clearly, using correct mathematical notation, and with sufficient explanation. A good rule of thumb is to write your solution so that a classmate who knows roughly what's going on in the course but doesn't know how to do this particular problem can understand your solution. As a side benefit, this makes it much more likely that you will be able to understand your solution when you go back to study for exams! The bottom line: for any written work handed in for the course, including lab write-ups, exams, and homework, *you must show your work.*

I reserve the right to adjust policies in this syllabus if necessary during the quarter.

Central Washington University is committed to creating a learning environment that meets the needs of its diverse student body. If you anticipate or experience any barriers to learning, discuss

your concerns with the instructor. Students with disabilities should contact Disability Services to discuss a range of options to removing barriers, including accommodations. Disability Services is located in Hogue 126. Call (509) 963-2214 or email ds@cwu.edu for more information.

Work due during the last week of classes: We will be covering new material through the end of the last week of classes. There may be homework due, and there will likely be a lab due. Tentatively, the second exam will be due during the last week of classes, and the final project write-up during finals week.

Homework: Homework will be assigned often and will generally be due a week after it is assigned. See above for general comments about written work in the course. Homework must be stapled and written on clean-edged paper (no notebook fringes!) or it will not be accepted.

Public Speaking: This is one of the few places where we explicitly include public speaking skills in our curriculum. This is a crucial skill, and one that can't be fully taught in one class. Rather, the class will provide you with some tools which will hopefully improve your speaking during the quarter, but also enable you to continue to improve after the course is done. We will be completing a series of public speaking assignments. Several of these will involve a short reading, watching some videos or talks, and giving a thoughtful analysis of what you observed. You will also prepare slides for a presentation.
After completing these steps, each person (or team) will give a talk about their work in class. Talks will be recorded, and students will take their videos home, watch them, and reflect and comment on their performance.
Students are strongly encouraged to give a talk at SOURCE (the Symposium of University Research and Creative Expression). This is an excellent opportunity, and one not to be missed. Abstracts are due by *Thursday, April 6*, so act quickly! Students/teams not presenting at SOURCE are required to present at the mathematics department seminar (the Mt. Stuart Math Seminar).

Labs and Lab Write-ups: Lab assignments will include questions to be answered, including relevant statistical analyses. Your lab write-ups must be submitted through Canvas by 3PM on the due date (typically these will be Thursdays). *NO credit will be given for late work, and there are no dropped lab scores.* Lab write-ups must be typed, written in complete sentences, and follow the general guidelines for written work given above.
We will be making use of the statistical software R in class, and you will be using R for labs and exams. R is a free, open-source software package that is incredibly powerful. I strongly recommend the interface R Studio and this is what I will be using and demonstrating in class. R has a bit of a learning curve, but it's well worth working through! R is becoming more and more of a standard in industry and other disciplines.

Exams: For in-class exams, make-up exams must be arranged ahead of time unless you can document an unexpected circumstance beyond your control that prevented you from taking the exam. For instance, in the case of illness, a doctor's note will be required. All make-up exams must be requested as early as possible. Exams requested more than 24 hours after the scheduled exam will be given only in extreme extenuating circumstances (e.g. hospitalization, jail . . .). When a make-up exam cannot be taken in a timely manner, typically before exams are returned to the class, I reserve the right to instead replace that portion of the course grade with an alternate assessment (possibly the second exam or final project, as appropriate).

R "wiki": Canvas doesn't have a "wiki" function, but does allow us to have group-editable pages. I've created a set of pages for various R topics. I'll post the information that goes in the beginning of lab assignments here, and as you come across useful R functions or snippets of code I encourage you to add them! There is no explicit credit or requirement for these, but I may give some extra credit for substantive contributions.