



STAT511A: Experimental Design and Data Analysis for Researchers I

Fall 2015

Section 001 (Local)

TR 2:00 – 3:50 Clark A 206

Instructor Information

Instructor: Dr. Ann Hess

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Phone: (970) 491-5077 (Note: email preferred)

Office Hours: T/R 3:50 – 4:30 (Clark A206), W 11-12 (Stat 218)

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Objectives: This course (together with STAT512) is designed to provide an introduction to statistical thinking and statistical methods for researchers. STAT511/STAT512 will provide researchers with a basic toolbox of methods for use in their research programs. Emphasis throughout will be on principles of design and inference, rather than the mechanics of the computations.

STAT511A will use R software. STAT511B will use SAS software. Students from either section will be prepared for STAT512.

This course is intended for graduate students who have had one statistics course, perhaps some time ago. STAT511/STAT512 will cover much of the material of STAT301 (Introductory Methods), STAT340 (Multiple Regression), and STAT350 (Design of Experiments), but will allow more advanced treatment of many topics and better integration of topics than the usual three-semester sequence. Attendance by graduate students will allow an interdisciplinary exchange of research ideas and experiences.

Prerequisites: Graduate standing plus one statistics course (STAT301, STAT307, STAT311, STAT315, etc) or consent of instructor.

Required Text: Ott and Longnecker, An Introduction to Statistical Methods and Data Analysis, Sixth Edition, Duxbury, 2008.

Data Sets: From the Ott & Longnecker companion site (see Canvas), download the datasets in CSV format. Download the zip file for “ASCII-comma” and then unzip the file. Note: The file extension is .TXT even though the files are actually CSV!

Course Web Page at Canvas: All course materials are available from Canvas. This will include lecture notes, examples, assignments and other material. *Students are expected to print a copy of the notes and bring them to class.* Note that all lectures will be recorded and available through Canvas. You will need your eid and password to log onto Canvas.

Canvas Discussion Board: Students are strongly encouraged to post questions and comments, respond and read the Canvas discussion board. (If your question is of a personal nature, then it is appropriate to email the TA or instructor directly.) The following suggestions will help make efficient use of the discussion board.

1. Please review previous discussions before making a new post.
2. Use the first line of the post to state the topic (**in bold**). Be specific! For example: HW1 Q2 part C.
3. If you need help with R code, review the R help document first. When posting, copy/paste the relevant code and the actual error/warning/output. Also show a summary of any input data using the str() function.

Computing: STAT 511A will use R. R is a free software environment for statistical computing and graphics. To install R, go to www.r-project.org, and click on “download R”, choose a CRAN mirror, and download R for your platform (binaries for base distribution).

We will also use RStudio, an IDE (integrated development environment). It is a program that makes it more convenient to work in R. Go to the website (www.rstudio.com) and download RStudio.

Grading:

	Grade Percentage	Tentative Dates
Homework	20 %	Due on Fridays by 4pm
Midterm 1	25 %	Thursday 10/1
Midterm 2	25 %	Thursday 11/5
Final Exam	30 %	Monday 12/14 6:20 – 8:20pm
Total:	100 %	

Academic Integrity: This course will adhere to the Academic Integrity Policy of the CSU General Catalog and the Student Conduct Code. On exams, students will sign a statement of the honor pledge “I have not given, received or used any unauthorized assistance.”

Exams: Exams are open book, open notes. For any exam conflicts, please email the instructor at least one week prior to the scheduled exam date. Also see the instructor for exam grading problems.

Homework: Homework will be assigned weekly, typically assigned on Thursday and due on Friday (4:00 pm) of the following week. You are encouraged to work together on homework, but the work turned in should be your own. By that I mean that all the computer output should be generated by you and the answers should be written by you. No late homework will be accepted (without prior approval). Homework can be submitted in pdf format via Canvas or turned in to the file found in **Statistics 102 – do not slide it under my office door!**

Homework format requirements: *Homework should be organized so that the grader can find your answers without searching through pages of computer output.*

1. Answer questions concisely.
2. Write your own sentences to answer the question instead of just copying and pasting output. Only present the output that is related to the question. If the question does not require output, then do not include it.
3. R code is not necessary unless specifically requested.

Notes about grades:

1. Withdrawal deadline is Monday 10/19.
2. A weighted average of 80% or better will guarantee at least a B; 90% will guarantee an A.
3. STAT 511 is usually curved moderately, but not until the end-of-semester grades.
4. There is no extra credit for the course.

Outline:

1. Gathering data and statistical inference (Chapter 2)
2. Random variables and probability distributions (Chapters 3* and 4*)
3. Inferences about the population central values (Chapter 5)
4. Comparing two population central values (Chapter 6)
5. Inferences about population variances (Chapter 7)
6. Inferences about more than two population central values (Chapters 8 and 15*)
7. Multiple comparisons (Chapter 9)
8. Categorical data analysis (Chapters 10 and 4*)
9. Linear regression and correlation (Chapter 11)
10. Logistic regression and additional regression topics (Chapters 12* and 13*)

*These chapters will be partially covered.