

CRIM 782: Statistics I

Spring 2017, Tuesday 4:30-7:10PM

Innovation Hall 203

(Last modified January 10, 2017)

Instructor

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- Office Hours: Tuesday 3:00--4:00pm and by appointment

Office Hours

My main office is located on the Fairfax campus and I have regular office hours at that location on Tuesdays (posted above). I will regularly be on campus on other days as well and am happy to meet with students at other times. The most reliable method of communication with me is through email. Please make use of my office hours or make an appointment if you are having trouble with the course material or have other course related concerns.

I will occasionally communicate with the entire class through email using your Mason email account. Please authorize that account and either check it on a regular basis or setup automatic forwarding to your preferred email address.

Course Description

This course will focus on descriptive and inferential statistical methods and theory. The logic of inferential statistical methods in general and null hypothesis significance testing in particular will be explored. Widely used statistical procedures within the social sciences will be studied. This course builds on the research methods learned in CRIM 780 and will provide you with a familiarity in performing data analyses using a common computer software program (R via RStudio).

Course Prerequisite

A prerequisite for this course is the completion of at least one undergraduate or graduate social science research methods course (e.g., from a sociology, psychology, criminal justice, economics, or political science department) or an undergraduate statistics course, preferably from a social science department. Although we make use of computer software for performing most of the computations, you cannot study statistics without do some math. Statistics is math. It is assumed that you understand basic principles of mathematics, such as the order of operations, exponents and roots, and fractions. It is also assumed that you can understand basic algebric equations.

Course Objectives and Learning Methods

The objective of this course is to prepare you for graduate level research, including your master's and doctoral thesis. Upon completion of this course you should have a strong conceptual understanding of descriptive statistical methods, including the graphical display of quantitative data, and be able to apply commonly used inferential statistical methods

to real world research problems. You will also have a firm understanding of null hypothesis significance testing and its limitations, the central limit theorem, the use of confidence intervals, and the distinction between parametric and nonparametric inferential methods. You will also develop skills in using R to perform statistical analyses.

Teaching Methods

This class will be a "flipped" class; lectures will be entirely online in Blackboard along with other instructional materials, such as freely available online tutorials. Class time will be used to answer questions regarding the lectures, review homework, do class exercises and work on homework due the following week. Given this approach, it is critical that you come to class prepared. You will have difficulty making effective use of class time if you do not.

Course Requirements and Grading

Your grade in this class will be based on online quizzes, weekly homework, and two exams (a mid-term and a final). The online quizzes (multiple choice) and weekly homework will be graded pass/fail. If you complete the homework, and not just some of it, it will be graded as a pass. If you do not complete the a quiz or homework assignment by the due date, it will be graded as a fail. There are 11 quizzes and 11 homework assignments. Your overall homework grade will be computed as follows:

11 quizzes, 11 homework assignments	A
11 quizzes, 10 homework assignments	A-
10 quizzes, 10 homework assignments	B+
10 quizzes, 9 homework assignments	B
9 quizzes, 9 homework assignments	B-
9 quizzes, 8 homework assignments	C
Less than the above	F

The mid-term will be an in-class exam and will involve a range of question types and will also involve the use of R. The final exam will be a take-home exam and will involve the analysis and interpretation of real world data. The final exam will be cumulative, requiring knowledge gained throughout the entire semester. Final grades will be a weighted average based on the following weights.

Assignment	% of Final Grade
Quizzes and Homework	20
Mid-term	30
Final Exam	50

Letter grades will be converted to a 4-point scale (like a GPA). Thus, an A will be 4.0, A- 3.67, B+ 3.33, B 3.0, B- 2.67, C+, 2.33, C 2.0, F 0.0. Final grades will be computed as the weighted average of these values and assigned as follows:

Final Grade	Cut-off
A	3.9
A-	3.57
B+	3.23
B	2.9
B-	2.57
C	2.0

It is your responsibility to come to class prepared. Preparation involves having completed the readings, viewing the online videos, and taking the quizzes assigned for a given week. The homework will be started in class and due the following week.

Texts and Readings

Required book for this course is:

Gravetter, Frederick J., and Wallnau, Larry B. (2013). Essentials of Statistics for the Behavioral Sciences (8th Edition). Cengage Learning. [Note: any edition from the 6th on will work for this class.]

Optional: Wheelan, C. (2013). Naked statistics: stripping the dread from the data. WW Norton & Company.

Tentative Course Schedule

The following course schedule is subject to change. Any changes will be posted on the class website.

Date	Topic	Readings/Assignments
Jan 24	Class Overview and Getting Setup and Started	Gravetter & Wallnau Ch 1 Wheelan Ch 1
Jan 31	Frequency Distributions & Measures of Central Tendency	Gravetter & Wallnau Chs 2 & 3 Wheelan Ch 2
Feb 7	Variability & z-Scores	Gravetter & Wallnau Chs 4 & 5 Wheelan Ch 3
Feb 14	Probability	Gravetter & Wallnau Ch 6 Wheelan Chs 5 & 5 1/2
Feb 21	The Sampling Distribution	Gravetter & Wallnau Ch 7 Wheelan Ch 6
Feb 28	Hypothesis testing	Gravetter & Wallnau Ch 8 Wheelan Chs 7-10
Mar 7	Mid-term	
Mar 14	Spring Break	
Mar 21	The Student's t-test	Gravetter & Wallnau Chs 9-11
Mar 28	Oneway ANOVA	Gravetter & Wallnau Ch 12
Apr 4	Two-way ANOVA	Gravetter & Wallnau Ch 14
April 11	Correlation	Gravetter & Wallnau Ch 15 Wheelan Ch 4
April 18	Simple regression	Gravetter & Wallnau Ch 16 Wheelan Ch 11
April 25	Chi-square & the Binomial test	Gravetter & Wallnau Chs 17 & 18
May 2	Review for final	
May 9	Final exam due	

Statement on Academic Integrity

I expect adherence to the University Honor Code. If I witness any violations of the Honor Code, I will follow the standard reporting procedures as outlined in the University Handbook. Most forms of cheating are self-evident and need no elaboration here. Plagiarism is not always well understood by students. Plagiarism is representing another's work as one's own. This extends to ideas as well as words. That is, if you paraphrase the ideas expressed in something you have read, you need to cite the author and source. Exact phrases, sentences, etc. from someone else's writing must be quoted and proper citation given.

Students with Disabilities

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Resources at 703.993.2474. All academic accommodations must be arranged through that office.