CRIM 535
Introduction to Quantitative Methods for Policy Analysis
University of Pennsylvania
Fall 2016

Lecture
Monday & Wednesday, 3:30-5:00 pm
395 McNeil Building

Lab
Friday, 10:00-12:00 pm
108 McNeil Building

Instructor
Aaron Chalfin
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Teaching Assistant
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Course Description
This course provides an introduction to applied statistical techniques in the social sciences and is tailored, in particular, to students pursuing the master of science degree in the Department of Criminology. It is taught as a basic course in statistics and presumes minimal mathematical or statistical background.

We'll begin with a brief introduction to the research process. We'll then cover the computation, interpretation and understanding of basic descriptive statistics, inferential statistics, sampling and distributions, measures of association and finally regression analysis. Depending on how much time we have, some of the other more advanced multivariate techniques may be briefly introduced.

More than anything, I would like for this course to be both useful and fun! I truly believe that judicious use of data is critical to getting criminal justice policy right and I expect that each of you will have a distinguished career in criminal justice policy (or a related field), a career in which you will have the opportunity to use data to improve public policy. It is my privilege to play a part in your statistics training.

Textbook
The recommended but not required textbook for the course is *Introduction to the Practice of Statistics*, 6th edition by David Moore, George McCabe, and Bruce Craig.

Lecture Notes
In addition to the textbook which serves as a reference, I will hand out lecture notes during the semester that will closely mirror the material we will cover in lecture. Whenever possible, I will combine lectures with an opportunity to apply concepts in the classroom using MS Excel – the goal is to make sure that you understand how to actually compute and interpret the statistics we are learning about. So I will ask that you please bring a laptop computer to class if at all possible.

Lab Sessions
In addition to lecture, on most weeks, you will have the opportunity to attend a computer lab session that will be led by the teaching assistant for the course, Colleen Berryessa. These sessions will allow you to apply concepts you learn in class to analyze real-world data. I encourage you to attend these sessions as the most enduring learning you will do in this class will be in front of the computer. In addition, the exercises you will work on in these sessions will be your problem sets for the term so there is a major advantage to working on these on Friday mornings with Colleen and your classmates.

Stata
You will be expected to use Stata to complete your problem sets and exams. While Stata will be available to you in campus computer labs, you are strongly encouraged to purchase Stata for your personal computer. You can find several options here:
http://www.stata.com/order/new/edu/gradplans/student-pricing/
The most inexpensive option is to purchase a six-month subscription to Stata IC for $75. If you are thinking about pursuing a Ph.D. in criminology or another social science and Stata is your software of choice, I would recommend purchasing a perpetual license ($198 for Stata IC; $395 for Stata SE). It's not cheap but unless you have access to a cluster, this is a tool of the trade that you will need to use frequently. Or you can use R which is free.

Evaluation
Your course grade will be determined on the basis of 200 possible points. Your letter grade will be assigned according to the following rubric where the points listed correspond to the minimum number of points needed to earn a particular grade.
• 196-200 points = A+
• 187-195 points = A
• 180-186 points = A-
• 174-179 points = B+
• 166-173 points = B
• 160-165 points = B-
• 154-159 points = C+
• 146-153 points = C
• 140-145 points = C-

• 134-139 points = D+
• 126-133 points = D
• 120-125 points = D-
• 0-119 points = F

Note: I reserve the right to lower these cutoffs as needed (e.g., Depending on the class' performance, I might decide that 170 points will earn an "A" and 150 points will earn a B).

Points will be determined on the basis of two in-class exams, a final exam and ten problem sets that you can start and potentially complete in weekly lab sessions.

Exams (120 points — 40 points each): Each exam will consist of a mix of short answer questions and computer exercises. The first two exams will be completed at home. The final exam is scheduled to occur during finals week but I may change this to a take-home exam as well. As of now, these are the dates of the two take-home exams. You will have 48 hours to complete these.

- Exam #1: Wednesday, October 5th
- Exam #2: Wednesday, November 2nd

Final Exam (40 points)

- Friday, December 16th; 3:00-5:00pm

Problem Sets (72 points — 9 points each): During the semester, I will hand out nine problem sets which you will begin working on during the weekly lab session. I will count your top eight problem sets – you are free to skip one. Each of the problem sets is designed to allow you to apply the material you have learned to work with real-world data using both MS Excel and Stata. You are welcome and even encouraged to collaborate with one another as you complete the problem sets. All I ask that each of you hand in your own copy of the problem set to be graded and that you write up answers in your own words.

Personal Statement (8 points): I'd love to get to know each of you a little better. I will ask you to send me a brief personal statement describing your academic background, career ambitions and anything else you would like for me to know about you. This is not intended to be onerous – please write as little (or as much) as you would like to share.

Academic Integrity
Students are expected to abide by the University of Pennsylvania Code of Academic Integrity, which is contained below. Additional information about expected standards of intellectual honesty can be found here: http://www.upenn.edu/academicintegrity/index.html

Since the University is an academic community, its fundamental purpose is the pursuit of knowledge. Essential to the success of this educational mission is a commitment to the principles of academic integrity. Every member of the University community is responsible for upholding the highest standards of honesty at all times. Students, as members of the community, are also responsible for adhering to the principles and spirit of the following Code of Academic Integrity.

Academic Dishonesty Definitions
Activities that have the effect or intention of interfering with education, pursuit of knowledge, or

fair evaluation of a student's performance are prohibited. Examples of such activities include but are not limited to the following definitions:

A. Cheating: Using or attempting to use unauthorized assistance, material, or study aids in examinations or other academic work or preventing, or attempting to prevent, another from using authorized assistance, material, or study aids. Example: using a cheat sheet in a quiz or exam, altering a graded exam and resubmitting it for a better grade, etc.

B. Plagiarism: Using the ideas, data, or language of another without specific or proper acknowledgment. Example: copying another person's paper, article, or computer work and submitting it for an assignment, cloning someone else's ideas without attribution, failing to use quotation marks where appropriate, etc.

C. Fabrication: Submitting contrived or altered information in any academic exercise. Example: making up data for an experiment, fudging data, citing nonexistent articles, contriving sources, etc.

D. Multiple submissions: submitting, without prior permission, any work submitted to fulfill another academic requirement.

E. Misrepresentation of academic records: Misrepresentation of academic records: misrepresenting or tampering with or attempting to tamper with any portion of a student's transcripts or academic record, either before or after coming to the University of Pennsylvania. Example: forging a change of grade slip, tampering with computer records, falsifying academic information on one's resume, etc.

F. Facilitating Academic Dishonesty: Knowingly helping or attempting to help another violate any provision of the Code. Example: working together on a take-home exam, etc.

G. Unfair Advantage: Attempting to gain unauthorized advantage over fellow students in an academic exercise. Example: gaining or providing unauthorized access to examination materials, obstructing or interfering with another student's efforts in an academic exercise, lying about a need for an extension for an exam or paper, continuing to write even when time is up during an exam, destroying or keeping library materials for one's own use., etc.

*** If a student is unsure whether his action(s) constitute a violation of the Code of Academic Integrity, then it is that student's responsibility to consult with the instructor to clarify any ambiguities.**

Preliminary List of Topics [subject to change]

Lecture	Date	Topic(s)	Lab
1	Wednesday, August 31st	Course introduction	--
	Monday, September 5th	**NO CLASS [LABOR DAY]**	
2	Wednesday, September 7th	Types of data and variables	Lab #1: Stata primer
3	Monday, September 12th	Measures of central tendency -- mean, median, mode	Lab #2: Measures of central tendency and dispersion
4	Wednesday, September 14th	Measures of dispersion -- variance, standard deviation; z-scores	
5	Monday, September 19th*	Distributions I: probability mass functions, cumulative distribution functions	Lab #3: Measures of dispersion
6	Wednesday, September 21st	Distributions II: The binomial, poisson, logistic and normal distributions	
7	Monday, September 26th	Sampling distributions and the central limit theorem	Lab #4: Confidence intervals
8	Wednesday, September 28th	Confidence intervals	
9	Monday, October 3rd	*Review for Exam #1*	--
10	Wednesday, October 5th	**CLASS CONVERTED TO OFFICE HOURS [EXAM #1]**	
11	Monday, October 10th**	Hypothesis Testing I: One-sample tests	Lab #5: Hypothesis testing
12	Wednesday, October 12th	Hypothesis Testing II: Two-sample tests	
13	Monday, October 17th	Application: Randomized controlled trials	Lab #6: ANOVA and F-tests
14	Wednesday, October 19th	Hypothesis Testing III: ANOVA and the F-Test	
15	Monday, October 24th	Bivariate association I: Chi2 tests	Lab #7: Bivariate association
16	Wednesday, October 26th	Bivariate Association II: Covariance and Correlation	
17	Monday, October 31st	*Review for Exam #2*	--
18	Wednesday, November 2nd	**CLASS CONVERTED TO OFFICE HOURS [EXAM #2]**	
19	Monday, November 7th	Linear Regression I: Derivation and assumptions	Lab #8: Linear regression
20	Wednesday, November 9th	Linear Regression II: Interpretation and inference	
21	Monday, November 14th	Linear Regression III: Measurement error	
	Wednesday, November 16th	**NO CLASS [AMERICAN SOCIETY OF CRIMINOLOGY CONFERENCE]**	--
22	Monday, November 21st	Multiple Regression I: Estimation and Inference	--
	Wednesday, November 23rd	**NO CLASS [THURSDAY-FRIDAY SCHEDULE]**	
23	Monday, November 28th	Multiple Regression II: Applied statistical modeling	Lab #9: Multiple regression I.
24	Wednesday, November 30th	Multiple Regression III: Applied statistical modeling	
25	Monday, December 5th	There is no Santa Claus: Cautions in Interpreting regressions	Lab #10: Multiple regression II.
26	Wednesday, December 7th	Special topic: TBD	
27	Monday, December 12th	*Review for final exam*	