

Soc-S371: Statistics for Sociology
Summer II, 2012
Course # 3163

Class: M, T, W, TH 1:00 pm-2:30, Ballantine Hall 330
Labs: T, TH 3:00 pm-4:00, Wylie Hall 125

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Course Description

Quantitative analysis is an important component of social science research and allows researchers to answer questions about single variables (e.g. how unequally are incomes distributed across a population?) and about the relationships between two or more variables (e.g. how does income change as people age?). This course is designed to provide students with an introduction to statistical reasoning and computation as a social research method. The course covers both descriptive and inferential statistics. Descriptive statistics are used to describe the properties of sets of numbers. Inferential statistics make use of sampling to estimate unknown characteristics of large populations. Inferential statistics are at the heart of social science research and are used when it is impractical or impossible to obtain data on an entire population. Although the course is not particularly mathematically intensive, a working understanding of basic algebra is required.

Required Material

Readings:

This course is primarily based on the material and notes presented in lecture with the addition of supplemental readings. Although, we do not work directly with a textbook, I strongly recommend, but do not require, the following book as a supplemental resource:

Miethe, Terance D. and Jane Florence Gauthier. *Simple Statistics: Applications in Social Research*. Oxford University Press.

This text usually sells for \$35-40. It is also possible to find good deals on other statistics texts if you search for used copies online.

You may also be interested in consulting the following online resource throughout this course: *Online Statistics: An Interactive Multimedia Course of Study*, by David Lane, Joan Lu, Camille Peres and Emily Zitek. <http://onlinestatbook.com/>

There will also be additional readings available on the class OnCourse site.

Calculator:

You will need a basic scientific calculator. Anything that has the square root ($\sqrt{\quad}$) and square (x^2) functions should be fine. You do not need a graphing calculator.

Software:

The labs in this course will make use of Stata, a statistical software package commonly used in academic and medical research. This software is available in computer labs on campus and I do **NOT** recommend purchasing it.

Course Requirements

Problem Sets:

I will hand out (or post online) problem sets regularly. These are not graded but are extremely valuable for learning the material. You will get the most out of the problem sets if you do them soon after you get them (don't let them pile up) and if you can resist the temptation to look at the answer key before working the problems.

In Class Assignments/Quizzes:

There will typically be an in-class assignment (or quiz, if you prefer to think of it this way) every Thursday, starting Thursday June 21st. Each is worth 100 points and there will be five total throughout the semester. You will have the entire class period to work on each quiz.

Tentative Assignment/Quiz dates: June 21, June 28, July 5, July 12, and July 19

Labs:

In addition to the Monday - Thursday class periods, you will also participate in lab sessions in which you will have the chance to analyze data using Stata and engage in other problem solving exercises. The lab sessions should help you master the class material by allowing you to get hands-on experience working with data and to improve your skills in statistical computation. It is of the utmost importance that you arrive to your lab session on time and well-prepared.

There will be a total of four graded lab assignments over the course of the semester, with one usually given every week. The lab assignment will be passed out during the lab session and the first will start June 26. You should be able to complete or nearly complete most lab assignments during the lab periods (If necessary we may allocate time for continued work on the Thursday lab periods). You are permitted (and encouraged!) to work on these assignments in pairs or small groups, however you must turn in your own work. Each lab is due in class (or during the lab period, if specified) on Thursday.

Final Project:

The final project will be the culmination of all your hard work through the summer and will require you to bring together many of the skills you have learned. The project will involve performing an analysis of a dataset, which I will provide, and writing up a report on your findings. Final projects will be due on Friday, July 27.

Group Presentation:

Students will participate in a group presentation in groups of two (we may have one group of three if necessary). Each group will be assigned one section of Darrell Huff's *How to Lie With Statistics* or Joel Best's *Stat Spotting* (both texts will be available on the class OnCourse website). You will be responsible for briefly explaining your section to the class as well as providing and explaining an example from the media relevant to your section. Groups, topics and presentation dates will be discussed and determined in class.

Participation:

Participation will account for approximately 50 points of your total grade. In a small class setting, engagement and participation are invaluable. Students who are actively engaged in the course and participate in class discussions will receive full credit for participation.

Attendance:

Given the fast-paced nature of this course and its focus on lecture notes, attendance is of vital importance. You may miss up to three class periods for any reason. Each additional absence that is not sanctioned by the university will result in a 1/3 letter grade reduction in your final grade.

Grading

Your final grade for the class will be based on the number of points you earn as a percentage of the total possible number of points. The number of points possible on each of the assignments and exams is shown below:

<u>Component</u>	<u>Points Each</u>	<u>Total Points</u>
Quizzes (5)	100	500
Final Project	200	200
Lab Assignments	100	400
Group Presentation	50	50
Participation	50	50
<u>Total</u>		1200

Letter grades will be assigned as follows:

A+	100-97%	(1200-1164)	C	76-73%	(923-876)
A	96-93%	(1163-1116)	C-	72-70%	(875-840)
A-	92-90%	(1115-1080)	D+	69-67%	(839-804)
B+	89-87%	(1079-1044)	D	66-63%	(803-756)
B	86-83%	(1043-996)	D-	62-60%	(755-720)
B-	82-80%	(995-960)	F	60-60%	(<719)
C+	79-77%	(959-924)			

Guidelines and Policies

Incompletes:

In accordance with departmental and university policies, I will not grant an incomplete except in cases of unusual or extreme circumstances.

Make up Quizzes/Assignments

Make-up quizzes typically will not be given. The only exception to this policy is when the situation involves extreme and unusual circumstances. You must also provide documentation of these circumstances. If you cannot take the quiz for some reason, you must contact me prior to the quiz. With my permission, you may take the quiz at a later date. Failure to get my permission will mean that you will not be able to take a make-up quiz. If there is an emergency on the day of the quiz, email me before the quiz is given and provide me with documentation of the emergency.

Academic Misconduct:

Academic dishonesty (such as cheating or plagiarism) will not be tolerated and will be dealt with according to university policy. Please see the Code of Student Rights, Responsibilities and Conduct for university policies on academic misconduct and academic dishonesty. (<http://www.dsa.indiana.edu/code/index.html>).

Special Needs

In compliance with the Americans with Disabilities Act (ADA), IU seeks to provide "reasonable accommodation" for qualified individuals with documented disabilities. It is the student's responsibility to inform me and to contact the Disability Student Service Office (855-7579; <http://www.dsa.indiana.edu/dss.html>) about any special learning/study needs relating to a documented disability.

Outline of Topics Covered in Class

Below is an outline of the topics to be covered during the course in the approximate order we will cover them. I have also listed readings from the recommended text that correspond to each topic.

Topic	Associated Readings
1. Introduction	Pgs. 1-13, 37-41
2. Univariate Descriptive Statistics	
a. Frequency Distributions	Pgs. 47-58
b. Central tendency of a distribution	Pgs. 73-87
c. Dispersion/variability of a distribution	Pgs. 94-99
3. Bivariate Descriptive Statistics	
A. Two qualitative variables: Contingency tables and related measures of association	Pgs. 188-201 (don't worry about the discussion of degrees of freedom or significance; we will get to this later).
B. Comparing groups: A qualitative independent and quantitative dependent variable	OnCourse
C. Two quantitative variables: Regression and correlation	Pgs. 235-248
D. Introduction to multivariate analysis	Pgs. 261-263
4. Inferential Statistics	
A. Probability and random variable distributions	OnCourse & pgs. 115-118
B. Sampling distributions	Pgs, 128-130 & OnCourse
C. Normal and standard normal distributions	Pgs. 105-115
D. Estimation	Pgs. 127-143
(1) Confidence interval for a mean	Pgs. 133-136, 140-142
(2) Confidence interval for a proportion	Pgs. 137-138, 142-143
E. Hypothesis testing	
(1) Logic of hypothesis testing	Pgs. 149-160
(2) Hypothesis test about a single mean	Pgs. 167-170
5. Hypothesis testing in multivariate analysis	
A. Comparing groups: Difference of means test and its extensions	Pgs. 173-175, 178-181
B. Contingency tables revisited	Pgs. 188-202
C. Regression and correlation revisited	
(1) Simple regression	Pgs. 248-251
(2) Multiple regression	Pgs. 266-271
D. Extensions and additional statistical tests, as needed for your projects	

Tentative Lab Schedule:

June 19	Introduction to Stata (ungraded)
June 26	Lab assignment #1
July 3*	Lab assignment #2
July 10	Lab assignment #3
July 17	Lab assignment #4
July 24	Work on final projects