Intermediate Social Statistics (SOC 470)

Spring 2017

Instructor:	Hyun Woo Kim, PhD Candidate (hxk271@psu.edu)
Office:	412 Oswald Tower, by appointment
Classroom:	071 Wilard Building, University Park Campus
Class hours:	1:35 PM – 2:50 PM, Tuesday and Thursday
	1:25 PM – 2:15 PM, Wednesday
Course website:	Not available

Course Descriptions

This course is primarily designed for Sociology undergraduate students. It covers the elementary statistical techniques commonly used in social science quantitative research. The course emphasizes the understanding of statistical concepts and uses of statistics rather than memorizing mathematical formulas. Students are NOT expected to memorize mathematical formulas or calculate them by hand.

The main objectives of this course are to learn (1) how, why, and when we use statistics in social research, (2) some basics of measurement issues, (3) what to describe about statistical data and how, (4) a couple of basic statistical tests to use when evaluating hypotheses, (5) how to conduct those tests using such computer programs as Microsoft Excel and how to interpret the results, and finally (6) how to present your findings to your audience.

The use of computers for analysis of real data is an important feature of this class. One of the most important goals in this class is to learn to analyze data using a computer in a way that will be useful in your other classes and post-college life. You are encouraged to develop research question(s) that you choose, and to conduct statistical analysis of existing data to find out the answer for yourself.

Course Prerequisite

Students need not complete any mathematics or statistics course prior to taking this course. You are required to complete Research Methods (SOC 207) before taking this course.

Course Materials

- Chava Frankfort-Nachmias and Anna Leon-Guerrero. 2010. *Social Statistics for a Diverse Society* (6th Edition). Sage. **Strongly recommended.**
- Laptop computer, iPhone, iPad, or a basic calculator for exercises, assignments, and examinations.

Course Organizations

- Lectures: All students must attend lectures. The lectures emphasize the general statistical concepts and principles. You are also encouraged to bring the textbook with you for reference when you attend the lectures. You are strongly encouraged to review your notes from every session after each lecture. If you miss class because you are ill or on a University sponsored trip, please notify me at hxk271@psu.edu prior to the beginning of class period on the day that you are absent. Barring an emergency situation, if you notify me later, I will not be able to give you an excused absence.
- Computer Lab Sessions: Attendance at lab sessions is also required every Wednesday. Computer lab sessions are led by the instructor or teaching assistant, and will be devoted mainly to using computers to practice database and statistical software skills. The instructor or teaching assistant will help you learn how to use the equipment and software in the computer lab.
- Homework Assignments: There will be 3 homework assignments. No late assignments will be accepted for credit unless under extreme circumstances.
- Examinations: There will be 3 examinations. You are allowed to use your textbook, course materials, or Internet. Each exam accounts for 15%, 15%, and 30% of the total grade, respectively. There will be no make-up examinations unless under extreme circumstances.
- Self-studies: You are expected to review what you have learned on a regular basis. There are also a plenty of online resources you can use. For examples, http://onlinestatbook.com/2/index.html, http://davidmlane.com/hyperstat/, http://vassarstats.net/textbook/, http://www.jerrydallal.com/LHSP/LHSP.htm, or http://www.sportsci.org/resource/stats/.

Grading Policy

All of your grades are up on Canvas. Please check your grades frequently so you can be sure they are correct. Please notify me of any problems within two weeks. Final grades will be assigned on the following basis.

- Attendance (10%)
- Exam #1 (15%)
- Exam #2 (15%)
- Exam #3 (30%)
- Homework #1 (10%)
- Homework #2 (10%)
- Homework #3 (10%)

Letter grades will be distributed on the following basis.

>= 93.00	A	80.00 – 82.99	B-	67.00 – 69.99	D+
90.00 – 92.99	A-	77.00 – 79.99	C+	63.00 – 66.99	D
87.00 – 89.99	B+	73.00 – 76.99	C	60.00 – 62.99	D-
83.00 – 86.99	B	70.00 – 72.99	C-	<=59.99	F

Academic Integrity

Penn State defines academic integrity as the pursuit of scholarly activity in an open, honest and responsible manner. All students should act with personal integrity, respect other students dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts (Faculty Senate Policy 49-20).

Dishonesty of any kind will not be tolerated in this course. Dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. Students who are found to be dishonest will receive academic sanctions and will be reported to the Universitys Judicial Affairs office for possible further disciplinary sanction.

Each college and campus has a specific policy for dealing with allegations of plagiarism with many intermediate steps. The most severe sanction is the XF grade which states that the student failed a class specifically because of Academic Dishonesty. The XF grade is a formal University disciplinary sanction and is reserved for the most serious breaches of academic integrity.

Disability Access Statement

Penn State encourages qualified people with disabilities to participate in its programs and activities and is committed to the policy that all people shall have equal access to programs, facilities, and admissions without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. If you anticipate needing any type of accommodation in this course or have questions about physical access, please tell the instructor as soon as possible.

Detailed Course Outline

Week 1 *Jan 10-12* Introduction to Social Statistics

Objectives: Know the expectations for students in this course; understand why statistics is useful for sociologists; know how typical social scientific research is conducted; understand the fundamental concepts of social statistics.

Reading: F.-N.& L.-G. Chapter 1.

Week 2 *Jan 17-19* Measures of Central Tendency and Dispersion

Objectives: Understand the concepts of mean, mode, and median; understand the concepts of range, variance, and standard deviation; know how to plot the measures of central tendency and dispersion.

Reading: F.-N.& L.-G. Chapters 4 and 5.

Week 3 *Jan 24-26* Measures of Association

Objectives: Know what cross-tabulation is; understand the differences between correlation and causal relations; understand the concepts of mediating, conditional, and spurious relationships.

Reading: F.-N.& L.-G. Chapter 10.

Week 4 *Jan 31-Feb 2* Data Presentation

Objectives: Know how to calculate and make tables and graphs depicting frequency and cumulative distributions; know how to present data graphically; know some issues of data distortion.

Reading: F.-N.& L.-G. Chapters 2 and 3.

Week 5 *Feb 7-9* Exam #1 Review and Exam #1

The first exam covers the topics from Week 1 to Week 4.

Homework assignment #1 dues.

Detailed Course Outline (cont.)

Week 6 *Feb 14-16* Probability and Sampling (I)

Objectives: Understand the characteristics of normal distribution and standard normal distribution; know how to transform a z-score to a raw score and vice versa.

Reading: F.-N.& L.-G. Chapter 6.

Week 7 *Feb 21-23* Probability and Sampling (II)

Objectives: Understand the process of sampling; know what the law of large numbers and the contral limit theorem are; understand the concepts of sampling error, sample means, and sampling distribution of the mean.

Reading: F.-N.& L.-G. Chapter 7.

Week 9 *Feb 28-Mar 2* Hypothesis Test (I)

Objectives: Understand the mean of sampling distribution and standard error; Know how to estimate confidence intervals for means.

Reading: F.-N.& L.-G. Chapter 8.

Week 8 *Mar 7-9* Spring Break - No classes

Objectives: Have some fun.

Week 10 *Mar 14-16* Hypothesis Test (II)

Objectives: Understand the overall process of statistical estimation; Know how to estimate confidence intervals for proportions.

Reading: F.-N.& L.-G. Chapter 8.

Week 11 *Mar 21-23* Exam #2 Review and Exam #2

The second exam covers the topics from Week 6 to Week 10.

Homework assignment #2 dues.

Detailed Course Outline (cont.)

Week 12 *Mar 28-30* Mean Comparison

Objectives: Understand the ideas of mean comparison; know how to calculate t-statistics using Microsoft Excel.

Reading: F.-N.& L.-G. Chapter 9.

Week 13 *Apr 4-6* Analysis of Variance

Objectives: Understand the ideas of ANOVA; know how to conduct ANOVA using Microsoft Excel.

Reading: F.-N.& L.-G. Chapter 14.

Week 14 *Apr 11-13* Chi-square Test and Correlation Analysis

Objectives: Understand the concepts of the chi-square test and correlation analysis; know how to calculate chi-square statistics and Pearson's product-moment correlation coefficient using Microsoft Excel; know when and how to use cross-tabulation analysis and correlation analysis.

Reading: F.-N.& L.-G. Chapters 11 and 13.

Week 15 *Apr 18-20* Regression Analysis

Objectives: Understand the ideas of bivariate regression analysis; know how to calculate regression coefficient and standard errors using Microsoft Excel.

Reading: F.-N.& L.-G. Chapter 13.

Week 16 *Apr 25-27* Exam #3 Review and Exam #3

The first exam covers all of the topics in this course.

Homework assignment #3 dues.