Sociology 360: Statistics for Sociologists I, Spring 2002 (02-2)
9:30 - 10:45 Tuesday/Thursday, 22 Ingraham Hall

Prof:	Lincoln Quillian 4426 Social Science 263-6292	TA:	Daniel Long 8144 Social Science 263-3857
E-mail:	quillian@ssc.wisc.edu		dalong@ssc.wisc.edu
Office hours:	Tues. 2 - 3; Wed. 11 - 12 (or by appointment)		Wednesday 2:30 - 4:30 (or by appointment)

Labs: 321: 7:50 - 9:45 Wednesday, 6105 Social Science
322: 4:35 - 6:30 Wednesday, 6109 Social Science
(Note: Some lab sessions will be held in the Social Science Microcomputer Lab [SSML], Room 3218 Social Science.)

Course Design and Objectives

Objectives: The general objectives of this course are to make you familiar with the basic ideas of statistics as they are applied in social research and more generally. At the end of this course you should be able to: use graphs, tables, and measures of central tendency and spread to summarize data; compute and interpret correlations and regressions for pairs of variables; explain random sampling using probability concepts; explain what a sampling distribution is and give a rudimentary explanation of its role in inferential statistics; test hypotheses about means, proportions, regression coefficients, and pairs of means and proportions; calculate and explain confidence intervals; and (if time permits) test the hypothesis of independence in a crosstabulation table.

Class Time: Class will usually consist of my lectures and answering questions. Lectures will focus on basic concepts and their application. Lecture attendance is not required, but attendance is recorded and does count a bit toward your grade.

Copies of the transparencies used in lecture are available from the social science copy center. (Copies of transparencies for a few lectures that are not in the packet will be passed out in class.) I strongly recommend that you buy the transparency copies and use them to follow along, while taking supplementary notes. This way you can spend more time listening and trying to understand, and less time writing things down. Most students tell me they find this helpful. Buying the course packet of transparency copies is *not* a substitute for coming to lecture. Much of the explanation included in the lectures are not included on these transparencies. Your responsibility for the exams includes what is covered in class, regardless of whether or not it appears on one of the transparency copies.

Prerequisites: Sophomore standing and basic algebra skills.

Texts

There are two required texts:

Moore, Davis S. *The Basic Practice of Statistics, 2nd edition*. New York: W.H. Freeman, 1999.

Anagnoson, J. Theodore and Richard E. DeLeon. *StataQuest 4: Statistics, Graphics, Data Management*. Belmont, CA: Duxbury Press, 1996. Be aware that there are several typos in the text–if it looks like it must be wrong, it may be. This text is packaged with Windows 95 software. If you have a computer that runs Windows 95, Windows 98, Windows NT, or Windows 2000, you can install it and use it at home. A network version is available on PCs at the SSML. There is no Macintosh version of the StataQuest software, so students with Macs will need to use the SSML.

There is also a *required course packet* for sale at the Social Science Copy center, room 6120 Social Science. The course packet contains copies of the lecture transparencies. The cost is about $7.00.

Recommended book (available at the University bookstore; not required to take the course):

William Notz, Michael Flinger, and Rebecca Sorice. *Study Guide for Moore's The Basic Practice of Statistics*. New York: W.H. Freeman and Company, 2000. This book accompanies the Moore text. It contains overviews of each chapter, and (probably more useful) it includes step-by-step solutions to some of the problems from the textbook.

Additional reading list: If you are interested in learning more about the topics covered in the course or would like another explanation of the material, some other books you might find useful are:

Gornick, Larry and Woollcott Smith. 1993. *The Cartoon Guide to Statistics*. New York: Harper Perennial.

Moore, David S. 1997. *Statistics: Concepts and Controversies*. Fourth edition. New York: W.H. Freeman and Company.

Both books can be checked out through the university libraries. These books cover portions of the course material in a clear and readable way, and may improve your understanding. There is nothing in them, however, that is required and is not covered in the required books.

Labs

There is a lab session that meets on Wednesday. Lab sessions will combine instruction and practice in statistical computing with review of the previous week's homework assignment. At

the beginning of the term, more time will be spent on computing, and later in the term, the focus will be on problem-solving.

Lab attendance is optional but recommended. Lab attendance will be recorded by the TA, but does not count in your grade. Lab attendance records may be used at the end of the semester in decisions about "pulling up" grades of students whose overall point total puts them slightly below the next highest grade.

The first lab sessions will meet on *Wednesday January 30th* –the second week of class. The first meeting will be in the social science computing lab (Social Science Room 3218), not in the assigned room for lab. This first meeting will include an introduction to using StataQuest in the lab.

Grading

Grades are assigned based on your point total, not your letter grade. Although getting 50 out of 100 and getting 0 out of 100 on a major assignment may both be grades of "F", getting 50 out of 100 will lower your final grade substantially less. Zero points on a major component of your grade can really lower your final point tally.

A significant share of your final grade–32.5%–is based on aspects of the course other than exams. This means that students who are diligent about doing the required assignments often end up with higher final grades than the average of their test grades.

The components of grades are as follows:

Three Exams--67.5%. The largest part of the grade is based on three in-class exams. In order to allow students who do poorly on one exam to have a chance to score well in the class, the lowest exam grade counts for 17.5% of the final grade, the other two exams count for 25% of the final grade each.

Homework–17.5%. Students who turn in all homeworks and do a reasonably good job can easily get an "A" on homework. Students can also significantly hurt their grade by not turning in large numbers of homework assignments. See "homeworks" below for grading of homeworks and homework policies. In final grade calculations your lowest homework grade is dropped. This may be a homework with a score of zero because it was not turned in.

Final Data Analysis Project–10%. This will be passed out during the last week or two of classes and will be due at the end of classes or the beginning of final exams. It is similar to the computer homework sets which are part of the homework. In the past, most students who have been responsible about doing the computer homeworks that lead up to it have done well on it.

Attendance at Lectures–5%. Attendance is not required, but is noted and does count a bit toward the final grade. Attendance is measured by signing in at the beginning or end of class. Students can miss one lecture without any effect on their attendance grade. Starting with the second absence, the attendance grade starts to drop, although students can miss about two additional classes and still have an "A" on attendance. This counts in the grade primarily to provide a bit of grade help for students who seem to be trying hard but not doing well on the exams (effectively it is a measure of "effort").

Examinations: There will be three, non-cumulative, in-class examinations. The first two exams will be given in class. The dates on the schedule are best guesses: exact dates will be announced during the semester. The third exam will be given during the regularly scheduled course final exam time during the summary period.

Examination questions will be a mix of true/false and multiple choice question, and open-ended questions requiring discussion, data analysis and calculation, and/or the selection of appropriate statistical methods. The exams are closed book. A copy of the quick reference card from the Moore book will be provided for your use on the exams. This card has copies of almost all of the formulas covered in the course.

Missed Examinations: If you miss an exam or part of an exam for a good reason (e.g. serious illness) you will be allowed to take a makeup exam. However, the makeup exams are more difficult than the regular exams. Thus, if you can I would recommend you take the regular exam. If you miss the exam without a good reason, there will be a point deduction in addition to taking the (more difficult) makeup exam.

Plan to be in town and available on the exam dates (on schedule below). However, the exam may be given up to a week prior or two weeks after the date on the schedule. I expect you to be able to attend the exam, even if changed from the tentative date on the schedule.

Homework

Grading: Weekly assignments will be made for Sociology 360. Due dates for assignments will be announced in class. Homework is due at the *beginning* of the class period on the due date. Homework not received at the start of class will be counted as late. Students arriving significantly late to class to turn in homework will have that homework counted as late.

Each homework assignment will be given one of three grades: “3” if complete, substantially correct, and well-documented; “2” if there are minor deviations from the “3” standard; “1” if incomplete, poorly presented, or showing little effort. Individual problems will not be marked in detail, but correct answers will be provided and discussed in lab. Problem sets that are exceptionally poor or fail to follow instructions may be rejected by the TA and may be resubmitted to earn a grade no higher than “2.”

Late assignments will be accepted *as long as they are before the final deadline for that assignment*, but will receive a score 1 lower than if that assignment was turned in on time. A homework that would have received a “3" would instead receive a grade of “2", a “2" would instead receive a “1", and a late assignment that would have received a “1" will count for nothing. If a catastrophic event prevents you from turning in a homework on time, you may be able to get an extension on the homework and thus turn it in late without getting reduced grade on that assignment. Barring extraordinary circumstances, such extensions will be short. If you need an extension, you should contact the TA **before** the homework is due. You are always welcome to turn in homework assignments early if you will not be able to come to the social science building on the due date.

There is a final homework deadline beyond which we will not accept late homework; any homework not received by this final deadline will receive a score of zero. The final deadline for

a homework assignment is the day of the exam that covers the material for that homework assignment, unless the homework assignment is due within one week of the exam. In this case, the final deadline for the assignment will be one week after the exam. In other words, late homework will only be accepted up to the day of the exam that covers that topic, except for homework assignments that are due within one week of the exam, which will have a final deadline one week after the exam.

The final homework grade is based on my dropping your lowest homework grade, summing scores for the rest of the homework problems, taking a percentage of the total, and applying a standard grading scale. The homework portion of the course grade often has an important influence on final course grades.

In the final grade calculation your lowest homework assignment grade will be dropped. This may be a score of 0 from not turning a homework in; this means that you can skip one homework assignment without penalty. Keep in mind, however, that you are still expected to know the material on all homeworks for the purposes of the exams and the final data analysis exercise.

Computer homeworks: Most of the problems on the regular problem sets are assigned from the Moore books and designed to be done as pencil-and-paper exercises (but there are a few exceptions–see calculator policy below). In addition, however, we will have five to seven problem sets handed out in class for which use of a computer is required to do the exercise. The exercises are designed to be done with the StataQuest 4 program, either at a home computer or in the Social Science Micro Lab (SSML). The computer problem handouts will include references to appropriate sections of the StataQuest 4 book that are helpful for that exercise.

Use of the StataQuest 4 program is recommended, but you may use another software package to do the computer exercises if you prefer. A more powerful alternative is Stata, which is available on many university computers. Course staff are not responsible for supporting the use of other software.

Computer homeworks are graded on the same scale and with the same rules about late homeworks as non-computer homeworks. The computer-based homework must have your printed computer output attached to it. The TA may also require you to annotate your computer output, and will set standards for formatting homework. Homework not correctly formatted may be rejected or receive a low grade. *You are required to provide your own computer floppy disk, IBM formatted, to save your homework log and data files for work done in the Social Science Micro Lab. Please bring your disk to any sections that will meet in the lab*.

Homework cooperation: For the normal homework assignments passed out throughout the semester, you may discuss the problems with other students in the class. This is in the spirit of discussing the homework problems with other students to further your understanding of the material. To simply copy another student's homework assignment and turn it in, however, is cheating. This rule also applies to computer homeworks and log files. You may not copy another student's log file and turn it in as your own, although you may discuss computer commands to get the answers to homework problems.

For the final data analysis exercise, no cooperation or discussion of problems with other students is permitted. Questions about the final data analysis exercise should be directed to

Professor Quillian or the TA.

Calculator Policy: Students will need a calculator for the homeworks and the exams. The calculator must be able to compute square roots and powers.

Many scientific calculators have some statistical functions "built in". Such calculators are not required for the course, and there are no problems on the exam that require such a calculator. The use of such calculators is, however, allowed on exams. Students who know how to use their calculator may have a small time advantage for some problems on the exam. Course staff are not responsible for helping you learn how to use the statistical functions on your calculator.

There are a few problems that will be assigned as part of the "regular" homeworks from the Moore textbook for which the calculations are too complicated to be done by hand (see the schedule below, where these are marked). These problems are best done in StataQuest; enter the data into the StataQuest editor and use StataQuest to do the calculations. Calculators with statistical functions may also be used for these problems.

E-mail list: There may occasionally be messages from me or the TA to the class distributed via an e-mail list. You are responsible for getting an account if you do not have one already, and for checking your e-mail daily to make sure you do not miss announcements. The e-mail list is for the use of the Professor and TA only. Do not send e-mails to the e-mail list address.

The e-mail list is based on a list of persons registered in the course maintained by the registrar. To be on the list, your e-mail address must be registered with the registrar using the EASI program (Extended Access to Student Information). If you activate a WiscWorld account, WiscWorld will automatically notify the registrar within one week. If you are having trouble with your e-mail address or need to get one, call the DOIT Help desk at 256-HELP.

Departmental Notice: The Department of Sociology regularly conducts student evaluations of all professors and teaching assistants near the end of the semester. Students who have more immediate comments, complaints, or concerns about Sociology 360 should report them to Professor Quillian; or else to Professor Gay Seidman, Associate Chair (seidman@ssc.wisc.edu); or to Professor Adam Gamoran, Chair, 8128 Social Science (gamoran@ssc.wisc.edu).

Feedback: I am interested to know your reactions to the course, and your suggestions for improvement. At one point during the semester we will have an informal evaluation at which time you are able to write comments or make suggestions anonymously. In addition, please feel free to e-mail me comments or suggestions to quillian@ssc.wisc.edu or to stop by during office hours.

SCHEDULE

Note: the schedule below is likely to change as we go along! Changes will be announced in class and/or by e-mail, so stay tuned. You are responsible for learning about these changes!

Problem numbers below are *from the Moore textbook chapter that is the reading for that topic*. Problem 2 for topic 1, then, is problem 2 from chapter 1 (labeled "1.2" in the book). Problem 50 from topic 3 is problem 50 from chapter 1 (labeled 1.50 in the book). Problem 14 from topic 4 is problem 14 from chapter 2 (labeled 2.14 in the book). "Handout" means there will be an additional handout in class with homework problems.

There will also be six to eight computer homework assignments, which are NOT shown on the syllabus below. These will be passed out in class and due dates will be announced in class. It is your responsibility to learn about these assignments and their due dates. Most computer assignments will be before the first exam and after the second exam (few will be due between the first and second exams, because the more conceptual material in this part of the course lends itself less to computer assignments).

Sociology 360: Statistics. List of Topics, Homeworks, and Readings.

Topic/ Lecture Number	**Tentative Dates**	**Title**	**Reading (*Moore*)**	**Problems (Moore)**
1	1/22, 1/24	Introduction, Graphing Distributions	1.1	2, 5, 8, 10, 16, 17, 24
2	1/29, 1/31	Describing Distributions	1.2	28, 32, 34(skip part c), 42, 46, 48, 82
3	2/5, 2/7, 2/12	Normal Distribution	1.3	50, 54, 56, 57, 60, 66, 88
4	2/12	Scatterplots and Correlation	2.1, 2.2	1, 8, 10, 14,18, 20, 23(*), 26, 28(*), 29
5	2/14, 2/19, 2/21	Simple Regression	2.3, 2.4	31, 32, 34, 36, 37(*), 41, 50, 53(*), 54, 56, 58, 60
6	2/26	Categorical data: cross tabulations	2.5	70, 74, 78, 86, 87 + handout
	2/28	**EXAM 1**		
7	3/5, 3/7	Sampling and Experiments	3.1, 3.2	4, 5, 7, 10, 14, 16, 18, 22, 28, 38, 50, 56, 57 + handout

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Topic/ Lecture Number	**Tentative Dates**	**Title**	**Reading (*Moore*)**	**Problems (Moore)**
8, 9	3/12, 3/14	Sampling Distributions, Probability, Sample Means	4.1, 4.2, 4.3	2, 10, 16, 18, 22, 43, 44, 49, 53 (auto accidents), 63
10	3/19, 3/21	Confidence Intervals	6.1	2, 4, 5, 8, 12, 18, 22, 23, 24
11	4/2, 4/4, 4/9	Significance Tests	6.2, 6.3	26, 28, 30, 32, 34, 38, 40, 44, 54, 55, 57, 81
	4/11	**EXAM 2**		
12	4/16, 4/18	Inference for the Mean	7.1	1, 2, 4, 6, 12, 20, 23, 59
13	4/23, 4/25	Comparing Two Means	7.2 (skip the optional "starred" sections at the end)	29, 33, 36, 44(*), 46, 62
14	4/30, 5/2	Inference for Proportions and Counts	8.1 (skip "choosing the sample size" pages 441-442), 8.2	8, 10, 18, 19 (skip part c), 26, 29, 40
14 ½	If time permits	Inference for Two-way Tables	9.1,9.2	To be announced
15	5/7, 5/9	Inference for Regression	11.1,11.2	To be announced
		EXAM 3, Sunday, May 12, 2:45 - 4:45 PM (Summary Period)		

NOTES: The homework questions with asterisks following them are probably best done in StataQuest. When the book says "do this with your calculator" it means using a calculator with special statistical functions; these problems can all be done in StataQuest.

Although the Moore book exercise are generally intended to be done by hand, if you prefer you can do most of the problems from the book in StataQuest. But on the exams you will have to do similar problems by hand, so you should do enough of the required problems by hand to be sure you can do them on the exam.