
SOC 510: Elements of Statistics and Data Analysis, Spring 2010, Fraser 107

- Instructor:** Meredith A. Kleykamp, Fraser 707,
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- TA:** Robert Hughes, Fraser 713,
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- Office Hours:** Kleykamp Wed. 10-12, and by appointment
Hughes, Mon. 10-12, and by appointment
- Textbook:** "The Basic Practice of Statistics, 4th ed." by David S. Moore
- Other requirements:** Calculator brought to **every** class (needs \sqrt{x} , exp, and ln functions)
Regular access to computer (We are PC users)
R Software program (provided in-class or available online at <http://cran.r-project.org/>)
Regular access to Blackboard and your KU e-mail account
- Prerequisites:*** SOC310, Sociology major or minor or permission of instructor,
MATH 101 or equivalent college algebra course

Course Overview:

This course introduces basic descriptive and inferential statistics, and various techniques of data analysis. Many students view statistics courses negatively, fearing the math involved (the math involves only basic algebra). Some see statistics used as tools, manipulated to "prove" anything and dismiss ALL statistics as bad (this course will help you weed out the 'good' from the 'bad' statistics). Statistics and statistical thinking are everywhere; you encounter statistics everyday when reading the paper, magazines, or watching the news. Sociologists use statistics to analyze data, to test sociological theories, and to inform public policy makers. As sociology majors, it is important for you to learn how to compute, apply, and interpret the statistical measures covered in class. This course introduces you to both statistics and data analysis—they go hand in hand. We will use technology to our advantage (pencil, paper, calculator, and computer); maintain an open mind about using the computer to help us solve problems. It will be terribly frustrating at first as you learn, but in the long run you will see the advantages. The whole discipline of statistical analysis is centered around being skeptical, questioning assumptions, and rejecting the obvious. This all involves a lot of critical thinking, which is hard, and it involves creativity. You have to think about things that are not right in front of you and imagine ways the data/findings/evidence might be wrong. (Dude, I thought this was just a math class!)

To judge your **learning** of the daily assigned material, you should understand WHAT concept and technique is being covered, WHY one would need to use it, HOW to compute/calculate a measure, WHEN you can and cannot use the technique and HOW to interpret it's meaning. Some other advice when **doing** statistical analysis is to THINK-SHOW-TELL. Think about what the problem involves, what the question asks and what techniques are relevant. Show the results—graphs or tables visually present or 'show' your analysis to others. But those don't speak for themselves. Give voice to your findings by telling the audience what you found and what the results mean.

*You should take the math self-assessment test available on the course Blackboard site (hereafter 'Bb') and evaluate your preparedness for the basic math and algebra in this course. If you are not comfortable with the concepts on this self-assessment you will find the math in this course challenging. You should review college algebra skills and be prepared to use those skills in this course. A college algebra course is a pre-requisite for the course. If it's been a long time since you took it—you should expect to spend ample time refreshing yourself on those skills BEFORE class begins.

Course Objectives:

Students should leave the course able to:

- explain basic concepts of statistics
- apply basic statistical techniques to research questions by hand and with the aid of software (You will learn how to use software to do statistical analyses in several class sessions, and through homeworks and assignments)
- more critically consume and evaluate quantitative arguments and evidence in popular and academic writing

Important Dates:

It is your responsibility to know important deadlines, college policies, and academic requirements. Please note the following important deadlines regarding add/drop for courses at KU:

- Last online drop date: Feb. 4
- Last day for Credit/No Credit grade option : Feb. 12 **You cannot elect this option if you are a sociology major, or a graduate student.**
- **April 15** is the last day to withdraw from a course.
- Stop Day May 7

You are responsible for collecting the necessary paperwork and signatures should you need to use these policies. I MAY NOT BE AVAILABLE ON THE VERY LAST DAY OF THE POLICY IF NOT A CLASS OR OFFICE HOURS DAY. Please plan accordingly. If you have further questions about these deadlines and policies, contact the Sociology Dept. Advising Specialist.

Scheduled course exams: Exam 1: TH, Feb. 18, Exam 2: TH, Mar. 25 Exam 3: T, Apr. 20.

Grade Policy:

Grades will not be settled by diplomacy or negotiation, and the grade you “need” has no impact on the grade assigned. If you need a particular grade, then EARN IT!

I use the new KU CLAS standard grading scheme (now a plus/minus system shown below).

Failure to perform passing work in any single area (exam, project, homework) may compromise your final course grade. Final grades will be based on the following weighting scheme:

Grade	Percent	Points	Assignment	Weight	Points
A	93.0-100%	930-1000	Homework	20%	200
A-	90.0-92.9%	900-929	Short Quiz	7.5 %	75
B+	87.0-89.9%	870-899	Exam 1	17.5%	175
B	83-86.9%	830-869	Exam 2	17.5%	175
B-	80-82.9%	800-829	Exam 3	17.5%	175
C+	77-79.9%	770-799	Final project ^a	20%	200
C	73-76.9%	730-769			
C-	70-72.9%	700-729	TOTAL		1000
D+	67-69%	670-699			
D	63-66.9%	630-669			
D-	60-62.9%	600-629			
F	Below 60%	less than 600			

^aMore information on the final project will be provided in a separate document.

Attendance: Attendance will be monitored, but not explicitly factored into your grade. However, only students with regular attendance will be considered for “rounding up” of border grades (border grades are within 1% point of the next grade) at the end of the semester. I don't post slides on Bb and you are responsible for getting missed material. If you choose not to come to class, do not make it my problem. From experience, attending every class may not guarantee good grades, but skipping class usually guarantees poor ones. Even graduate students who miss two classes in a row have felt they fell quite behind by doing so.

Grade Appeals: If you feel Robert or I have made an error in grading your work, you must submit a written appeal, documenting the purported error, and explaining how the grading was incorrect within a week of receiving the grade.

Class Norms and Expectations :

You are expected to attend all lectures and complete all assigned readings. You will be tested on material presented in class, in the textbook (you will not be responsible for “starred sections” unless otherwise notified), in handouts (including the syllabus), homeworks, or in assigned readings. Expect to spend a considerable amount of time outside of class to do the readings, to complete the homeworks, and to work on the final project. Expect to begin assignments early. Most assignments cannot be completed in a couple of hours the night before the due date. The **ONLY** way to really learn statistics is by doing and practicing regularly and consistently.

If you are having difficulty in this course, seek help before it is too late. In statistics courses you must have read and processed material from the text **BEFORE** lecture to be successful. Lecture time presumes basic familiarity with the assigned materials. If the first time you see material is in class, you will often be lost and not get as much out of class.

Ultimately, you are all adults and I will treat you as such. I know from experience both as a student and teacher of statistics that such courses are relentless. Material is cumulative and it doesn't ease up over time. To be successful, you should plan to devote ample study time for every single class. **If you cannot devote yourself to regular work in this course, you should not take it!** If you need a specific grade, you can easily see how many points are needed for that grade, and calibrate your effort in the course to attain those points. I know most of you need this to graduate—it's a required course for SOC majors. That fact isn't factored in to grades.

Please turn all electronic communication devices **OFF** before class. No cell phone use of any kind is allowed during class. If you bring and use a laptop it should not be used for anything but this class, and you should sit in the back row so as to not distract other students. Violations of this policy (i.e. distracting me or others by web surfing or emailing) will be called out and repeat offenders are subject to a reduction of grade. Quizzes and exams will begin promptly at the start of class.

Homeworks, projects and LATE WORK: Homework assignments will be due roughly every 7-10 days. They are due **at the beginning of class**. Once class begins, homework is considered late, as we will often discuss it in class. I do not accept late homeworks—they are given a grade of 0. You may discuss homework with other students, but must write up your solutions independently. Homeworks will be graded not only on the correctness of the answer, but the clarity of your presentation. You should turn in a hard copy of all homeworks, unless otherwise instructed. **Students who submit all homeworks (including computer lab assignments) will be eligible to drop their lowest homework grade.**

Exams: Students will be allowed a single side of a regular sheet of paper to use as a “cheat sheet” for formulae or other key concepts in exams. You should expect to show your work for all problems on exams for full credit when applicable. You **MAY NOT** use statistical or other advanced functions on your calculator during exams. I do not offer ‘make-up’ exams. If a KU-sponsored activity (athletics, conference, or the like) forces your absence on an exam day, you can take the exam early. **I provide these dates early so that you do not schedule conflicting activities on these dates.** Any emergency that arises that keeps you from taking a scheduled exam (death in the family or health emergency) must be documented through the Academic Achievement and Access Center in 22 Strong Hall, 4-4064. Without such documentation, you may not make-up a missed exam.

Course Content & Outline:

Exam dates are inflexible, though I reserve the right to adjust the schedule as needed (with changes typically announced in class). A more detailed course schedule will be passed out and available on the Bb site.

Material in the first third of the course covers the basics of taking many, many data values (a distribution) and using only one or two numbers to summarize and describe that distribution. It will also cover material you should be familiar with from SOC310—levels of measurement, sampling, experimental design—as well as new material on probability and sampling distributions. In the second third of the course we will use this background to do data inference—that is we will be able to quantify how probable it is that the data we are examining from a sample reflect the larger population from which it was drawn. We use confidence intervals and hypothesis testing to apply inferential statistics to find answers to real-world research questions. In the last part of the course we will extend both data reduction and inference to more complicated situations where we are interested in relationships between two or more variables. Throughout, we will rely on technology, both our calculators and computers, to facilitate our analysis.

Intro	1 day
Chapter 1&2 (Describing data distributions/data reduction)	approx 2 days
Computer training	1 day
Chapter 3 (Normal distributions)	approx 1 day
Short quiz	(Feb. 2)
Chapter 4& 5 (2 variable relationships)	approx 2 days
Multiple regression	approx 1 day
Chapter 6	1 day
Computer training	1 day
First Exam	1 day (Feb. 18)
Chapter 8&9 (Producing data-sampling and experiments)	approx 1 days
Chapter 10 (Probability basics-what is random?)	approx 1 day
Chapter 11 (Sampling distributions)	approx 2 days
Chapters 14-16 (Introduction to inference)	approx 3 days
Second Exam	1 day (Mar. 25)
Chapter 18&19 (Inference distributions: 1&2 samples)	approx. 2days
Chapter 20&21 (Inference proportions: 1&2 samples)	approx 2 days
Chapter 24 (Regression inference)	approx 2 days
Chapter 23 (Inference for Cross-tabs)	approx 1 day
Computer training	1 day
Third Exam	1 day (Apr. 20)
Critical reading of published work	1 day
Project work days (in lab)	1 days
Project poster presentations	1 day (May 6)
Final project paper due	May 13, by 10am

Accommodations:

The staff of Disability Resources, 22 Strong, 785-864-2620 (v/tty), coordinates accommodations and services for KU courses. If you have a disability for which you may request accommodation in KU classes, please contact SSD as soon as possible. I will need to receive a letter from SSD to accommodate any disability. Please also see me privately in regard to this course so we can discuss accommodations necessary to ensure full participation in this course and your college experience.

If any class-related activity, including exams, conflict with religious observances of a generally recognized nature that you are under obligation to participate in, you may complete the activity at an alternate time that is mutually agreed upon. In such cases you **MUST** contact me at least 1 week in advance to arrange for an alternate date. Students are expected to complete any work assigned for any class missed due to religious holiday.

Communication with Instructor and TA:

Office hours are times when we are guaranteed to be available (barring an emergency); we can make appointments to meet if you are unable to come to regularly scheduled office hours. We will only take administrative questions over e-mail, and will answer detailed substantive questions in-person. Math is difficult to explain over e-mail. We cannot guarantee that we will receive or respond to e-mails outside of regular business hours, or on weekends (i.e. we also have lives/families outside of work.) Plan accordingly.

Please do not communicate with us via telephone (e-mail is preferred) it ensures a paper trail of our communications. I keep all copies of sent and received emails from students and you should keep e-copies of your sent mails so that they can be resent if we do not receive them. If you have an emergency please leave a message with the front office in the Sociology department (864-4111). Neither the instructor nor TA will discuss homeworks, exams or assignments after 5pm the day **before** they are due. Please look over assignments early to clarify any questions you may have.

I strive to communicate with students in a professional and respectful manner, and expect the same in return. Please see the Center for Teaching Excellence's "Keys to Civility" pamphlet for guidance. <http://www.vpss.ku.edu/pdf/Civility%20Brochure.Fall06.pdf>

Additional Remarks:

Cheating will not be tolerated and may result in severe academic sanctions including course failure. Disruptive or rude behavior in class will not be tolerated, and I will ask any student whose behavior negatively affects the learning environment to leave the class. On the other hand, asking and responding to questions in class is vital and shows your engagement and understanding of course material.

We will use a statistical software program to perform many calculations, analyses and to generate graphic representations of data. Basic tutorials and guidance will be provided on its use. There are many resources for learning the basics on the web if you find yourself stuck. There are many programs that do similar things, such as SPSS, Stata, SAS, etc... If you use another program already and would prefer to stick with it-that's fine (but don't rely on us for assistance with alternate softwares). These programs should all produce the same or very similar results, and we are using them as tools to facilitate calculation. Also note: we are not Mac people and your mileage with what we say for the PC may vary with a Mac. We probably don't know why something won't work on a Mac, nor can we fix the problem. You should consult with Mac experts or use a PC for this course.

My final wisdom is that it is not the math in this course that is challenging, rather it is the concepts and knowing how to convert the concepts into the appropriate analyses. Sometimes solving a problem is the easy part, it's understanding what the problem is asking that is challenging. But this is a challenge worth meeting, as the logic of statistical analysis undergirds a lot of the kinds of work you may do in the future. And believe it or not, many students leave this course actually ENJOYING what they have learned! And several have gotten lucrative jobs based on their newfound love of statistics and data analysis!