

SOCY 10: QUANTITATIVE ANALYSIS OF SOCIAL DATA

Fall 2020

Professor: Gregory Sharp
Email: Gregory.K.Sharp@Dartmouth.edu
Office Hours: By appointment: <https://calendly.com/gregorysharp>

Location: Remote
Time: MWF 8:55-10:00
X-hour: Th 9:10-10:00

Extra Stata help: Jianjun Hua Jianjun.Hua@Dartmouth.edu (email Jianjun to schedule an appointment)

COVID-19 STATEMENT

It is important to acknowledge that we are living through extremely difficult and unprecedented times. For many of us these are filled with stress, anxiety, and uncertainty. I do not want this course to add to an already stressful situation. Rather than proceed in 'business as usual' fashion, I want us to take a step back and prioritize understanding, kindness, flexibility, and community. Though the vast majority of the class is asynchronous, there will be plenty of opportunities to connect with me and your classmates. I hope that we can regularly share ideas and learn from one another, and in the process develop a better understanding of how statistics can help us make sense of what we see and experience around us.

Course Description

This course is intended to provide an introduction to basic statistical techniques used by researchers to investigate social, economic, and political phenomena. The statistical techniques you will learn are simply tools to organize data and present information effectively about the world. For example, researchers have recently employed these statistical techniques to answer the following kinds of questions:

- "How have societal opinions about same-sex marriage changed over time?"
- "Do people who live in impoverished neighborhoods have better or worse health than those who do not?"
- "Are birth defects related to local levels of water pollution?"
- "Does getting a college degree have the same labor market benefits for Black and White individuals?"

By the end of this term, you too will be skilled enough in the art of statistics to address these types of questions. Just as important, however, this course is designed to help you become informed consumers of social statistics. This will involve attaining an awareness of the many uses of statistics in everyday life, gaining the ability to think critically about the use of statistics, and developing the skills necessary to interpret and critique social scientific research employing these techniques.

This course is designed to introduce you to the logic of statistical analysis, not to test your mathematical abilities. A rudimentary familiarity with basic arithmetic and a few algebraic functions will suffice for material presented in the course. This means that even if you are insecure about your math prowess, this class should not intimidate you. More than anything, success in this course requires diligence. The material covered in the course is incremental, with the presentation of new material building on what you learned in earlier segments of the course. You will have the greatest chance of success if you view recorded lectures regularly, start your problem sets early, and make sure to visit office hours to get clarification on issues about which you are unsure.

Course Structure/Delivery

The course is designated "asynchronous, with synchronous components," but most of the course is asynchronous. As for synchronous components, I will be available during our regularly scheduled class times (8:55-10am MWF) if you would like to discuss anything, but attendance is not required unless we have made a one-on-one or group appointment.

Recorded Lectures/Demos: At the beginning of each unit, I will post recorded lectures and slides on each topic. I recommend viewing these lectures and the slides and, if you choose, using the textbook to supplement what I cover in these lectures. I will also be recording our Stata lab sessions, which I hope will be similar to online tutorials. Remember, you will have ample opportunities to meet with me one-on-one to ask questions on any material we cover asynchronously.

Course Materials and Resources

Textbook (Optional): Healey, Joseph F. 2015. *Statistics: A Tool for Social Research (10th Edition)*. Stamford, CT: Cengage.

- I recommend either buying a used version or [renting](#) for the term. You also might want to look into buying or renting the even cheaper [9th edition](#).
- Again, the book is not required but recommended. Many of you might be able to get by fine by solely using my recorded lectures and slides. If so, that's great, but students may want the book as an added resource.

Here are some other optional texts that we will not use, but might be of interest to you:

Acock, Alan. 2012. *A Gentle Introduction to Stata* (Revised Third Edition). College Station, TX: Stata Press.

****If you are having trouble with Stata, this is an excellent resource.**

Bergstrom, Carl T. and Jevin D. West. 2020. *Calling Bullshit: The Art of Skepticism in a Data-Driven World*. New York: Penguin.

Best, Joel. 2001. *Damned Lies and Statistics: Untangling Numbers from the Media, Politicians, and Activists*. Berkeley: University of California Press.

Firebaugh, Glenn. 2008. *Seven Rules for Social Research*. Princeton: Princeton University Press.

Silver, Nathan. 2012. *The Signal and the Noise: Why So Many Predictions Fail—But Some Don't*. New York: Penguin.

Wheeler, Charles (Dartmouth '88). 2013. *Naked Statistics: Stripping the Dread from the Data*. New York: WW Norton.

Ziliak, Stephen T. and Deirdre N. McCloskey. 2008. *The Cult of Statistical Significance: How the Standard Error Costs Jobs, Justice, and Lives*. Ann Arbor: University of Michigan Press

For a good application of statistics to everyday life, I recommend that you add these blogs to your daily reading:

Family Inequality (Phil Cohen): <http://familyinequality.wordpress.com/>

Five Thirty Eight (Nate Silver et al.): <http://www.fivethirtyeight.com/>

Vox (Ezra Klein et al.) www.vox.com

The Upshot (NYTimes) <http://www.nytimes.com/upshot/>

Wonkblog (WaPo): <http://www.washingtonpost.com/blogs/wonkblog/>

Statistical Modeling, Causal Inference, Social Science (Andy Gelman) <http://andrewgelman.com/>

Statistical Software and Electronics

We will be using Stata 15 for recorded demonstrations, problem sets, and the final project. Stata is available for free on the Dartmouth Network (Mac/PC) and is also available on most public computers on campus. If you are off campus, you can use [Dartmouth's Global Connect VPN](#) to access the KeyServe. For more information on Stata resources and installing Stata on your computer, see the below websites. Please use these resources and the helpdesk for any installation questions.

MAC: <https://services.dartmouth.edu/TDClient/1806/Portal/KB/ArticleDet?ID=64644>

PC: <https://services.dartmouth.edu/TDClient/1806/Portal/KB/ArticleDet?ID=64632>

Info for using Stata off campus: <https://services.dartmouth.edu/TDClient/1806/Portal/KB/ArticleDet?ID=64133>

A brief note on Stata: Learning a new statistical analysis program and programming language is difficult. I highly recommend that you practice on your own to hone your skills. I also recommend that you meet with me or Jianjun if you have Stata related questions.

Here are some wonderful Stata coding resources you should check out:

Stata YouTube Channel: <https://www.youtube.com/user/statacorp/videos>

Jianjun Hua's research guides: <http://researchguides.dartmouth.edu/content.php?pid=316205&sid=2587562>

UCLA Stata Resources: <https://stats.idre.ucla.edu/stata/modules/>

Stata Online Course and Cheat Sheets: <http://geocenter.github.io/StataTraining/>

Princeton Stata Resources:

<http://data.princeton.edu/stata/>

<http://dss.princeton.edu/training/StataTutorial.pdf>

http://dss.princeton.edu/online_help/stats_packages/stata/

Calculator: You will also need a calculator to complete your problem sets and exams. A basic, inexpensive calculator that has square-root and squaring functions will suffice. Alternatively, you can use your cell phone calculator, but make sure you can square and take square roots of numbers. If you do have a graphing calculator with advanced functions (such as automatic calculations for standard deviations, t-tests, ANOVA, etc.), please do not use these advanced functions on exams.

Course Requirements and Grading

Exams (60%): There will be three exams (see schedule below for dates) each worth 20% of your total grade. While not strictly cumulative, each exam will require the use of skills learned earlier in the term. Each exam will consist of a series of problem sets plus a few multiple-choice questions. You will be free to use any of the course resources at your disposal (notes, slides, book), but you are not to collaborate with anyone during the exam. You will not use Stata during the exams, but I may ask you to interpret Stata output.

NOTE: Exams will be administered on Canvas during a 24-hour time period, and once students begin the exam, they will have to complete it within a set time (2 hours). So, if the exam is released at 5pm EST on a Monday, for example, students will have 24 hours from that time to start the exam and two hours from that time to complete it. See the course schedule for exam dates and notify me immediately if conflicts arise.

Group Project (40%): Students will also have the opportunity to conduct a project with their classmates—roughly 3-4 students per group (see the description of the project on Canvas.). The group project is one of the most important, and perhaps the most rigorous aspect of this course. These projects will require a significant time commitment, so it is important to choose a topic that you are excited about and to start working on it early! At the end of the term, you will be asked to evaluate the contribution of your fellow group members to the project. These evaluations will be factored into your project grade. In addition, the group project has several components, with the final report worth the lion's share of the points. The breakdown for the group project grade is as follows:

Group Project Assignment 1:	10%
Group Project Assignment 2:	10%
Group Project Assignment 3:	10%
Final Report:	70%

A final draft of the research report should be submitted to Canvas or emailed to me by Tuesday 11/17, but can be submitted any time before the deadline.

Problem Sets (0%): There will be 8 ungraded problem sets this term. Given our current circumstances, these problem sets are not to be turned in to me. I will provide the answer key with each assignment, so that you can check your answers after completing the problems. I am happy to meet with students during synchronous class sessions and office hours to discuss any questions regarding the problems. Please use these times to ask questions

about the problems or Stata and rather than emailing me questions. These exercises are designed so that they should be completed before we begin the next topic.

NOTE on problem sets and exams: It is important that you show your work! If you write down the answer without showing how you got to that answer, even if that answer is correct, you may not receive full (or perhaps any) credit. So, practice do this on your problem sets and you will be in good shape for the exams.

Grading Scale: Below is the percentage breakdown on which your final grade will be based.

Final Grade	Percent:
A	95-100
A–	92-94.9
B+	89-91.9
B	83-88.9
B–	80-82.9
C+	77-79.9
C	73-76.9
C–	70-72.9
D	60-69.9
E	Below 60

Relevant Policies and Resources

Late Policy: Students should notify me via email if/when you need an extension on an assignment (not an exam). I am willing to grant one 24-hour extension on any assignment, no questions asked. But after that, late assignments will have their grade reduced by 7 percentage points for each day late (e.g., 1 day late a grade of 100 would be reduced to a 93; 2 days, 86; and so on). Given the circumstances, I am willing to be flexible with this policy, within reason. **Remember to please meet with me if you are having difficulty keeping up with the coursework.** Also note that if you foresee a conflict with an exam date, please contact me as soon as possible so we can make the necessary arrangements.

Accessibility Resources: Students requesting disability-related accommodations and services for this course are encouraged to schedule a phone/video meeting with me as early in the term as possible. This conversation will help to establish what supports are built into my online course. In order for accommodations to be authorized, students are required to consult with Student Accessibility Services (SAS; student.accessibility.services@dartmouth.edu; <http://www.dartmouth.edu/~accessibility/>; 603-646-9900) and to email me their SAS accommodation form. We will then work together with SAS if accommodations need to be modified based on the online learning environment. If students have questions about whether they are eligible for accommodations, they should contact the SAS office. All inquiries and discussions will remain confidential.

Academic Integrity: Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner and all members of the Dartmouth community are expected to act in accordance with this principle. Academic integrity includes a commitment not to engage in or tolerate acts of falsification, misrepresentation, or deception. Such acts of dishonesty violate the fundamental ethical principles of the Dartmouth community and compromise the worth of work completed by others. As such, dishonesty of any kind will not be tolerated and students found in violation of the Dartmouth Academic Honor Principle will be notified and reported to the appropriate authorities (<http://student-affairs.dartmouth.edu/policy/academic-honor-principle>). For additional resources on the Academic Honor Code, plagiarizing, and proper citation of sources, please see the following link: <http://writing-speech.dartmouth.edu/learning/materials/sources-and-citations-dartmouth>

Religious Observance Policy: Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course (such as an exam day), please meet with me before the end of the second week of the term to discuss appropriate accommodations.

Basic Needs: Your safety and well-being are more important than anything going on in class. Please feel free to reach out to me if you need to talk. Any student who faces challenges securing food, housing, or personal safety is urged to contact the Dean of the College for support.

Statement of Mental Health and Resources: The academic environment at Dartmouth is challenging, our terms are intensive, and classes are not the only demanding part of your life. There are a number of resources available to you on campus to support your wellness, including your undergraduate dean (<http://www.dartmouth.edu/~upperde/>), Counseling and Human Development (<http://www.dartmouth.edu/~chd/>), and the Student Wellness Center (<http://www.dartmouth.edu/~healthed/>).

Consent to Record: Please see the following language regarding your consent to recordings (<https://dcal.dartmouth.edu/resources/course-design-preparation/syllabus-guide>).

1. Consent to recording of course and group office hours:
 - a) I affirm my understanding that this course and any associated group meetings involving students and the instructor, including but not limited to scheduled and ad hoc office hours and other consultations, may be recorded within any digital platform used to offer remote instruction for this course;
 - b) I further affirm that the instructor owns the copyright to their instructional materials, of which these recordings constitute a part, and distribution of any of these recordings in whole or in part without prior written consent of the instructor may be subject to discipline by Dartmouth up to and including expulsion;
 - c) I authorize Dartmouth and anyone acting on behalf of Dartmouth to record my participation and appearance in any medium, and to use my name, likeness, and voice in connection with such recording;
 - d) I authorize Dartmouth and anyone acting on behalf of Dartmouth to use, reproduce, or distribute such recording without restrictions or limitation for any educational purpose deemed appropriate by Dartmouth and anyone acting on behalf of Dartmouth.
2. Requirement of consent to one-on-one recordings:
 - a) By enrolling in this course, I hereby affirm that I will not under any circumstance make a recording in any medium of any one-on-one meeting with the instructor without obtaining the prior written consent of all those participating, and I understand that if I violate this prohibition, I will be subject to discipline by Dartmouth up to and including expulsion, as well as any other civil or criminal penalties under applicable law.

NOTE on the Course Schedule: It may take a couple of weeks to become accustomed to this sort of asynchronous, with some synchronous components schedule. The dates below are listed to help you manage your time and workload. Remember, all lectures and slides will be delivered asynchronously. To reiterate, I will be available during class time if you would like to discuss anything, but there is no required attendance unless we have made a one-on-one or group appointment. As it stands, we do not have any scheduled synchronous meetings (except the first day of class), but I plan to be available during two class sessions per week during the term. Let's take Week 2 as an example. By Monday (9/21), you should have completed the problems on Ch. 1-2 and should also plan to view the lecture for Ch. 3 (and skim the chapter if you choose). By Wednesday (9/23), you should have viewed the Ch. 4 lecture, and by Friday (9/25) viewed and worked through the recorded Stata demonstration. Note that lectures, slides, problem sets, and Stata demos will be posted to Canvas early in the week so that you can work at your own pace. It is always better to get started early so that you can come to me (or Jianjun) with questions.

Course Schedule
(Syllabus is subject to change with advanced notice)

Date	Topic	Textbook/ Lectures	Due Dates
M, 9/14	Course Introduction		
W, 9/16	The Research Process	Ch. 1	
F, 9/18	Basic Descriptive Statistics; Intro to Stata	Ch. 2	Prob Set #1 (on Ch 1-2)
M, 9/21	Measures of Central Tendency	Ch. 3	
W, 9/23	Measures of Dispersion	Ch. 4	
F, 9/25	Stata Demo		Prob Set #2 (on Ch 3-4)
M-T, 9/28-29	Exam #1 (on Canvas)		
W, 9/30	The Normal Curve and Z-scores	Ch. 5	
F, 10/2	Stata Demo		Group Project Assignment #1 Due
M, 10/5	Sampling Distributions	Ch. 6	Prob Set #3 (on Ch 5-6)
W, 10/7	Confidence Intervals	Ch. 7	
F, 10/9	Stata Demo		Prob Set #4 (on Ch 7)
M-W, 10/12-14	Hypothesis Testing (Two-Sample Tests)	Ch. 9	Prob Set #5 (on Ch 9)
F, 10/16	Stata Demo		Group Project Assignment #2 Due
M-T, 10/19-20	Exam #2 (on Canvas)		
W, 10/21	Analysis of Variance (ANOVA)	Ch. 10	
F, 10/23	Chi-Square Test	Ch. 11	
M, 10/26	Stata Demo		Prob Set #6 (on Ch 10-11)
W, 10/28	Bivariate Correlation	Ch. 13	
F, 10/30	Stata Demo		Group Project Assignment #3 Due
M, 11/2	Bivariate Regression	Ch. 13	
W, 11/4	Stata Demo		Prob Set #7 (on Ch 13)
F, 11/6	Exam Prep		
M-T, 11/9-10	Exam #3 (on Canvas)		

W-F, 11/11-13	Multivariate Analysis; Stata Demo	Ch. 15	Prob Set #8 (on Ch 15)
M, 11/16	Work on final research report (meetings)		
T, 11/17	Group Final Report Due (11:59pm EST)		