Quantitative Analysis of Social Data
SOCY 10—Winter 2021
Course meets Remotely in ZOOM

Professor: Kristin Smith **J, T/TH 10:20-12:10 ET**
Kristin.E.Smith@Dartmouth.edu **X-period: F 4:00-4:50 ET**
Office: 301B Blunt Hall **Office hours**: Wed 1-3pm ET
Phone: 603.646.8168 or by appointment

STATA help: Jianjun Hua Jianjun.Hua@Dartmouth.edu
Email Jianjun to schedule an appointment

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Course description

This course provides an introduction to basic statistical techniques used by researchers to investigate social, economic, and political phenomena. The statistical techniques you will learn are really just tools to effectively organize data and present information 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 grow up in impoverished communities 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 quarter, 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. The emphasis of the class is on understanding the concepts and appropriate uses of quantitative methods rather than deriving and memorizing the formulas. A rudimentary familiarity with basic arithmetic and a few algebraic functions will suffice for material presented in the course. More than anything, success in this course requires diligence. The material covered in the course is very incremental, with the presentation of new material building on what you learn in earlier segments of the course. You will have the greatest chance of success if you attend class or view the lectures regularly, start the problem sets early, keep up on your reading, and make sure to visit office hours to get clarification on issues about which you are unsure.

Course Readings

Textbooks: I highly recommended students reference the Joseph Healy book listed below, which can be purchased online or rented for $30 from the publisher.

Highly Recommended Text
Healey, Joseph. 2014. *Statistics: A Tool for Social Research, 10th edition.* Stamford, CT: Cengage.

Rent from Cengage - https://www.cengage.com/c/statistics-a-tool-for-social-research-10e-healey/9780357671238PF/
or Amazon - https://www.amazon.com/Statistics-Research-Joseph-F-Healey-ebook-dp-B00H7HU8E2/dp/B00H7HU8E2/ref=mt_other?_encoding=UTF8&me=&qid=]

An older version of the Healey text is available for free online:
:https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnx1Y2Njb2RlbWJhfGd4OjIyNTc0ZGU1ZThhYmU3ZmI

*I recognize that the latest edition of this book is relatively expensive. Thus, you are welcome to purchase a previous edition of the book at a reduced cost. If you encounter financial challenges related to this class, please let me know.

Below is a list of optional texts that you may find useful to have on your bookshelf. I will be drawing from these readings (and will occasionally assign chapters on Canvas) throughout the course.

Optional Texts:
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.

Best, Joel. 2001. *Damned Lies and Statistics: Untangling Numbers from the Media, Politicians, and Activists.* Berkeley: University of California Press.
Bergstrom, Carl T. and Jevin D. West. 2020. *Calling Bullshit: The Art of Skepticism in a Data-Driven World*. New York: Penguin.
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.
Wheelan, 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 Us Jobs, Justice, and Lives.* Ann Arbor: University of Michigan Press

For a good application of statistics to everyday life, I highly 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 16 for in-class 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. For more information on STATA resources and installing STATA on your computer, see the following websites:

https://services.dartmouth.edu/TDClient/1806/Portal/KB/?CategoryID=13109

MAC: https://services.dartmouth.edu/TDClient/1806/Portal/KB/ArticleDet?ID=64644
PC: https://services.dartmouth.edu/TDClient/1806/Portal/KB/ArticleDet?ID=64632

Please use these resources and the helpdesk for any installation questions.

In most classes, we will be using STATA in order to demonstrate statistical techniques. I have scheduled weekly STATA labs (see course schedule for details). We may have STATA labs in the last 35 minutes of class from time to time.

A brief note on STATA. Learning a new statistical analysis program and programming language is challenging. To be successful at learning something new, you must practice outside of class to hone your skills. There are many ways for you to get help with STATA: You may ask another student for help with STATA, or ask Juanjun Hua, or visit me via Zoom during office hours with STATA related questions. We will work through this together! In addition, here are some resources that will help you as you learn to code in STATA:

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 to have a calculator to complete your assignments and quizzes, and to participate in in-class exercises. A basic and inexpensive calculator that has square-root and squaring functions is best for use in this class. *Make sure to bring your calculator to class every day and to all assessments.*

Study group. The Academic Skills Center may be able to arrange a study group for this class. This has been a great resource for students who are less confident in the class. If you are interested in joining the study group contact the Skills Center.

Course Requirements & Grading

Exams (20% each). There will be three exams administered via Canvas throughout the term. Students will have a set amount of time to complete the exam (within 2 hours). 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.

Problem Sets (0%). There will be 3 ungraded homework problem sets this term. I will review the problem sets for completion. For each problem set, I will designate which questions you are required to answer – the rest of the problems can be viewed as practice problems, completed on your own time. Problem sets will be due at the time and date indicated in the Course Schedule. **Assignments must be uploaded to Canvas—do not email them to me.** For hand-calculations, you may take a photo of your paper and upload it to Canvas.

Students are welcome to work together and help each other on problem sets, **but each person MUST turn in their own assignment and provide answers <u>in their own words</u>**. Assignments will be posted on Canvas a week before they are due (at the latest). If you did work with someone, please put their names at the end of your homework. I will post answer keys for each problem set by 5 pm the day after they are due so you can check your work. You should be completing the problem sets and checking your work to make sure you are keeping up with the material.

While your problem sets are ungraded, I will collect problem sets and mark for completion. **<u>I will return incomplete homework (that is submitted on time) and request that you resubmit it if it does not meet standards for adequate completion. If you foresee a problem with meeting the due date for a homework assignment, contact me and we will come up with a solution. I will not review problem sets turned in more than 72 hours after the original due date.</u>**

Group Project (Assignments, Presentation, and Final Product: 40%). Students will have the opportunity to conduct a project with their classmates, with 3 (or possibly 4) students per group (see the description of the group 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: 5%
Group Project Assignment 2: 10%
Group Project Assignment 3: 10%
Presentation: 15%
Final Report: 60%

A final draft of the research paper should be submitted via Canvas by <u>Tuesday 3/9</u>, but can be submitted any time before the deadline.

<u>I will use the following scale in assigning grades:</u>

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

Please note the following about grades: 1) I do not round grades; 2) I **<u>do not negotiate final grades</u>** unless an error was made.

Course Guidelines and Policies

Course attendance: Class will be held in real time in Zoom. Students who cannot attend at the specified class time will have the option of viewing a recording of the lecture. If you plan to take this course asynchronously and will not attend any of the real-time classes, contact Professor Smith and we will arrange to meet <u>prior to each exam</u> via Zoom at a mutually convenient time. Class attendance and participation are not part of your final grade, however, students who attend class regularly tend to do

better in this course. I assume that you are serious about your commitment to this class and thus presume that missed classes are due to a good reason. In the event that you miss a class for any reason, you are responsible for getting class notes from another student. As a general policy, I do not make my notes available. After you review your classmate's notes, I would be happy to meet with you to talk about the material or answer questions about anything that is unclear.

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.

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 holidays: Some students may wish to take part in religious observances that occur during the academic year. If you have a religious observance that conflicts with your participation in the course, please meet with me as soon as possible to discuss appropriate accommodations.

Students with disabilities: 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; SAS website; 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.

Remote-learning in the fall term may be challenging due to the impact of the COVID-19 pandemic on all of us. 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/).

For individual peer tutorial assistance with papers, research, and new media projects, students may use RWIT, the Student Center for Research, Writing, and Information Technology. Make appointments online at www.dartmouth.edu/~rwit.

Classroom etiquette: Interacting in a remote, on-line classroom is new for all of us. We will need to determine a set of guiding principles so we can interact respectfully in Zoom. Disruptions to class negatively affect everyone's ability to learn. Everyone should arrive to zoom on time. If you must arrive late or leave early, please notify the instructor in advance. Although there is no way for me to monitor your activity, **It is inappropriate to use cell phones or use laptops for activities outside of taking notes (such as email, facebook, shopping, etc.) during class.** Students will be offered a short break (5-10 minutes) during the course. Students should respect the time frame and return to class within the time allotted.

Course Schedule

This syllabus is a working document. The course schedule will likely change over the course of the term. You are advised to check the Canvas Website regularly for changes.

Week	Class	Topic	Readings	Assignment Due Dates
WEEK #1	Th 1/7	Course Introduction		News article on statistics
	F 1/8	Optional Drop-In on Zoom		
WEEK #2	Tu 1/12	The Research Process; Working with and displaying data	Healey Ch. 1 Healey Ch. 2	Upload STATA to computer
	Th 1/14	Measures of Central Tendency STATA LAB: Set up STATA	Healey Ch. 3	Select Groups
	F 1/15	STATA LAB 1: Introduction		
WEEK #3	Tu 1/19	Measures of Dispersion	Healey Ch. 4	
	Th 1/21	Normal Curve and Z scores	Healey Ch. 5	
	F 1/22	STATA LAB 2		HW #1 Due 10pm
WEEK #4	Tu 1/26	Intro to Sampling	Healey Ch. 6	Class Project #1 Due 10pm
	Th 1/28	Confidence Intervals	Healey Ch. 7	
	F 1/29	QUIZ #1		QUIZ #1 Due 10pm
WEEK #5	Tu 2/2	Hypothesis Testing: Two Sample	Healey Ch. 8, 9	
	Th 2/4	STATA LAB 3		
	F 2/5			
WEEK #6	Tu 2/9	Analysis of Variance	Healey Ch. 10	Class Project #2 Due 10pm
	Th 2/11	Chi-Square & STATA LAB	Healey Ch. 11	
	F 2/12	STATA LAB 4		HW #2 Due 10pm
WEEK #7	Tu 2/16	Correlation	Healey Ch. 13	
	Th 2/18	Bivariate Regression	Healey Ch. 13	
	F 2/19	QUIZ #2		QUIZ #2 Due 10pm
WEEK #8	Tu 2/23	Multivariate Analysis	Healey Ch. 15	Class Project #3 Due 10pm
	Th 2/25	Multivariate Analysis: Elaboration	Healey Ch. 15	
	F 2/26	STATA LAB		
WEEK #9	Tu 3/2	STATA LAB		HW #3 Due 10pm
	Th 3/4	Group Presentations		
	F 3/5	Group Presentations		
WEEK #10	Tu 3/9	Group Presentations Group Paper Due		Group Paper Due 10pm
	Final Exam--TBD			

**We do not have time to cover Healey Ch 12 or 14; I recommend you read these chapters on your own.