SOC6302H | Winter 2021 | Department of Sociology | University of Toronto

Statistics for Sociologists

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Class Mon 11 a.m. - 1 p.m.
Location: Online
Tutorial Tue 4 – 5.30 p.m.
Location: Online

Quercus https://q.utoronto.ca/courses/206559

Course Description & Learning Objectives

Quantitative methods represent one set of tools in sociologists' methodological toolbox to answer questions about the social world. This course is designed to introduce you to basic statistical techniques for analyzing quantitative data, laying the groundwork for more advanced classes you may take in the future. The course focuses on understanding statistical techniques, learning how to apply them and how to interpret the findings.

We will cover descriptive and basic inferential statistical techniques, including regression analysis. You will examine how these techniques have been applied in sociological research, and get hands-on experience preparing and analyzing data yourself using Stata, a statistical software popular in Sociology. And you will also have the opportunity to practice how to communicate statistical findings effectively to audiences who may not be familiar with statistical analyses.

In order to learn and master statistics, you will need to devote a considerable amount of time outside of class working through the course material and practicing the techniques. The ability to solve problems and get information out of a group of numbers requires not just the memorization of the techniques but centrally learning through practice. The class provides a range of opportunities to practice through the weekly homework, the research assignments, and the examples we will work on in class and tutorials.

Course Goals

1. Introduce you to basic statistical techniques, both descriptive and inferential, and to provide you with a foundation for more advanced courses in statistical methods
2. Develop your ability to interpret and to write about statistical results
3. Develop your practical skills using Stata to manage and analyze data
4. Provide you with the experience of exploring and working with large secondary data
5. Connect the course material to the practice of sociological research: Practice evaluating studies applying the statistical techniques covered in class

COVID-19 Note

This course is currently structured as a fully remote-learning class, given the evolving COVID-19 pandemic. Should the situation permit it, the class may be restructured to include in-person components in accordance with university and public health guidelines, as well as student needs.

Preparing for the Course

Mixed feelings about math or taking Stats? Statistics seems like a daunting subject for many students. Especially if you haven't used your math skills in a while, you might feel apprehensive about taking this course. But learning statistics is not just numbers; it includes more generally problem-solving and logic. This course does not require more than **knowledge of basic algebra**. However, it does require you to be comfortable using formulas and to understand mathematical notation. We will not use derivations and advanced mathematical concepts. If you are unsure about whether you remember the required algebra, you'll be able to access a **math self-check quiz** on Quercus and a **text with practice examples** that will help you review the necessary concepts.

Getting to each other. Taking a class remotely can have its advantages (I can imagine that we won't miss having to venture out during those cold snowy winter days that are sure to come…). But it will also make it harder to get to know everybody in the virtual classroom. I look forward to meeting you, to learn about your research interests, and to talk to you about any questions or concerns you may have related to this course. To facilitate introductions, I would like to invite you to book a meeting slot on Quercus during the first or second week of classes. For instructions please see the section "Communication & Getting Help" below.

Learning Components & Course Requirements

Readings and Video Tutorials. This course follows the model of a "partially flipped" classroom, where students are expected to study some of the course content on their own, with additional content covered during class. Each week, you will be given a set of concepts to study before class using the **assigned readings** and **short video-lectures** accompanied by **self-check questions** (not for credit) on Quercus. There will be **discussion boards** where you can post questions while working through the material each week. We will answer them either on the discussion board itselfor, depending on the question, during class time.

It is easy to get lost in a course where each week's content builds on the material of previous weeks. It is crucial to keep up with the readings and video lectures, and to attend class and tutorials regularly to help you stay on track.

Class Sessions. This class will meet weekly on Zoom. We will use these class periods in several ways: a) based on the questions posted by class members on the discussion boards we may recap concepts covered in the pre-class materials, b) we will elaborate on concepts covered in the assigned readings, c) go over challenging problems on the homework assignments, and d) do practice examples, sometimes together, sometimes in smaller groups.

Tutorials. The tutorials are designed to help you learn the analytical skills you will need to complete the research assignments for this course using Stata. The tutorials will have two components: a) **Stata video tutorials**, which you will be expected to watch before the tutorials, and b) **lab exercises** applying the statistical concepts covered in class and the Stata skills you'll learn in the video tutorials. We will use the tutorial time to help you work through these exercises, to answer students' questions, and to

troubleshoot any computing problems you may encounter. You can either start working on the lab exercises before the tutorial sessions, or work on them together with other students during the tutorial. The data sets and computer code for the labs will be posted ahead of the tutorial sessions on the Quercus course page.

Weekly Homework Assignments. There will be 10 homework assignments over the course of the semester. For the most part, you will be able to complete these online on Quercus (sometimes, I may ask you to post a picture of your calculations). These assignments cover all the material from a given week (pre-class self-study materials and the concepts covered during class). Homework assignments will be posted after class on Monday afternoon, and they are due 24 hours before the next class period on Sundays at 11 a.m. The homework assignments provide you with the opportunity to practice the material in a relatively low-stakes environment (*each homework assignment worth 4% of the final grade, 40% in total*).

Research Assignments. Over the course of the semester, you will complete three research assignments (see Overview of grade components below). These assignments will vary somewhat in content, i.e. you will be asked to complete one or more of the following tasks: 1) Find 2 published articles in your area of interest that use the statistical techniques covered during the preceding weeks and evaluate how they were employed; 2) Complete a set of analyses using a given data set and interpret your findings; 3) Formulate your own research question(s) and answer this question(s) using survey data of your own choosing and the statistical techniques covered in class. Separate instructions for these research assignments will be posted on Quercus.

- **Choosing your data set**. In the first couple of weeks of the class, you will be asked to find a data set you wish to work with for your 2nd and 3rd research assignments. You will find several suggested data sets including the accompanying documentation on Quercus. Please **book a consultation in week 4 on Quercus** either with Irene (if your name starts with TBA) or Julia (if your name starts with TBA). We would like to learn more about your research interests, and help you develop possible research questions that you may tackle with the data set you plan to use.
- **Paper Presentations**. For the last class session, students will prepare short presentations on their work for the 3rd research assignment. Separate instructions will be posted on Quercus.

Overview of grade components

		Each worth	Fraction of final grade
10 x	Weekly homework assignments	4%	40%
2 x	Research Assignments 1 and 2	15%	30%
1x	Proposal Research Assignment 3		3%
1 x	Research Assignment 3		17%
1 x	Project Presentation		10%
	Total		100%

Grade Scale

Percentage grades will translate to letter grades as follows (Truncated Refined Letter Grade Scale):

Percentage	**Letter Grade**	***Percentage***	**Letter Grade**
90-100	A+	*77-79*	B+

85-89	A	*73-76*	B
80-84	A-	*70-72*	B-
		0-69	Fail

Course Materials

Required Readings

- Agresti, Alan & Barbara Finlay (1997). Statistical Methods for the Social Sciences, 3rd edition. Pearson. (Used copies can be found online for around CAD25-30 or less. Please order your textbook early. A lot of used copies are shipped from the U.S. and might take a while to arrive.)
- Miller, Jane E. 2004. The Chicago Guide to Writing about Numbers. Chicago: University of Chicago Press. [Available as a digital holding in U of T Libraries: http://go.utlib.ca/cat/11570628]
- Plus selected readings from additional texts (available on Quercus)

Supplemental Texts

- Longest, Kyle C. 2012/2015. *Using Stata for Quantitative Analysis* (1st or 2nd editions). [Available as a digital holding in U of T Libraries: http://go.utlib.ca/cat/8965089]
- Menard, Scott. 2002. Applied Logistic Regression Analysis, 2nd Ed. Thousand Oaks, CA: Sage

Optional Texts

- Acock, Alan C. 2006-2014. *A Gentle Introduction to Stata*. College Station, TX: Stata Press.
- Long, J. Scott. 2009. *The Workflow of Data Analysis Using Stata*. Stata Press: College Station, TX: Stata Press.
- An excellent resource for findings solutions to Stata problems is the website maintained by the Institute for Digital Research and Education at the University of California, Los Angeles [https://stats.idre.ucla.edu/stata].

Statistical Software and Computing

Statistical Software. The tutorials will offer a first introduction to Stata, a user-friendly program, ideal for data management, for statistical analysis, and for creating graphical representations of your findings. Beyond this necessarily cursory introduction, numerous resources for learning and mastering Stata are easily available on the web or through published books (see the optional course reading texts). Tutorial sessions will draw heavily from the supplemental text, Using Stata for Quantitative Analysis (Longest, 2015).

Though all labs will be conducted in Stata, feel free to complete your assignments in alternative programs (e.g., R, SAS, SPSS), so long as you include reproducible syntax scripts in your assignments. That said, we can best support you and your work if you use Stata.

- The program is available in the department's lab computers, which are accessible remotely (see separate instructions on Quercus).
- If you would like to use Stata on your own computer, the company offers a "GradPlan" which provides software and manuals at a reduced price for enrolled students (see https://www.stata.com/order/new/edu/gradplans/student-pricing). The standard version of Stata

(Stata/IC 16) is available for as little as ~CAD63 (USD48) for a 6-month license, CAD123 (USD94) for a 1-year license, or CAD294 (USD$225) for a perpetual license.

Communication & Getting Help

Email. Please use your **University of Toronto email** to communicate with me about **personal matters**. I will do my best to respond to your emails within 24 hours from Monday to Friday between 9 a.m. and 5 p.m.

Asking questions about the course material on Quercus. To clarify questions regarding the **syllabus**, **assignments**, as well as substantive questions about **assigned texts** and the **material discussed in class**, please use the designated **discussion boards on the course website** outside of class time or tutorials. If something is unclear to you, chances are good that other students may have the same or a similar question! Using discussion boards rather than email ensures that everybody has access to the same information.

Office hours. Please do not hesitate to talk to us about the course material, the assignments or if you have any other concerns about the class. If you have questions about the course content it best to seek clarification as soon as possible.

The **instructor's** and the **TA's office hours** are **by appointment**. Please use the **Quercus Calendar tool** to book a time slot. To book a meeting click on the "Calendar" in the Quercus menu on the left-hand side, then click on the "Find Appointments"-button on the right-hand side. Each slot is 15 minutes. If you think that we'll need more time, you can book one or more additional adjacent slots. You can also leave a note in the "comments" box, e.g. what you would like to talk about. Should all the slots for a given week be taken, please email me (irene.boeckmann@utoronto.ca).

Mentimeter. Occasionally, we will use an interactive audience engagement app in class. You can use Mentimeter by downloading the app to your phone from your favorite app store, or by going to menti.com if you prefer using your laptop. Mentimeter does not require you to create an account. You will use a code to access the questions for a given class.

Late Submission of Assignments & Grade Appeals

Late Submission of Assignments. All assignments are due at the beginning of class (see class schedule). Unless you have a documented reason beyond your control (e.g., family emergency, illness) late submission will result in a 5% deduction for each 24-hour period the assignment is late.

If you must miss the deadline for an assignment, please notify me in advance or as soon as possible to arrange for the submission of the assignment together with the necessary documentation. Please note that under university regulations, extensions are only required to be provided in circumstances where students inform the instructor of their circumstances within 7 days of the missed assignment due date.

Grade Appeals. I do my very best to grade work fairly, consistently, and accurately. Nevertheless, unintentional errors may occasionally occur. If you believe that your assignment has been mismarked, please adhere to the following rules:

- Please **wait for 24 hours** after the assignment has been returned to the class before submitting your request. All requests for re-grading should be made **within two weeks** of the date the assignment was returned. Re-grading requests submitted at a later date will not be considered.
- Submit a **short memo** that clearly states specific reasons to justify the request and backs up these reasons with evidence from your assignment.
- For simple mathematical errors, simply alert me of the mistake.

If your appeal is deemed appropriate, the entirety of your assignment will be re-graded. Please note that upon re-grade your mark may go up, stay the same, or go down.

Academic Integrity and Working With Other Students

Academic integrity is required of all students at the University of Toronto. If you are unsure about some aspects of academic integrity, please do not hesitate to talk to me. Plagiarism or other violations will be addressed in accordance with University guidelines. Please be cautious in this matter, as the penalties for academic misconduct can be quite severe. Know where you stand by reading the "Code of Behaviour on Academic Matters" in the Calendar of the Faculty of Arts and Science. **It is your responsibility to read this material and comply fully with it.**

Working together. Statistics is a course where many students find it useful to work together. Explaining aspects of the course materials to others can help you to more fully understand the statistical techniques discussed in class, identify unclear points, and work through challenging material. Students may work together on assignments, but the submitted work must be unique (e.g., interpretations must be written independently and not copied, research questions for student-selected data should not be identical). For assignments requiring analyses using Stata, all syntax must be included (please upload a separate Stata do-file with each assignment either as a Stata ".do" or text ".txt." file). **Students who are working together on classwork should also indicate who they worked with on each assignment (if anyone)**. This will guard against situations where a student's academic integrity might be called into question.

Accessibility Services

It is the University of Toronto's goal to create a community that is inclusive of all persons and treats all members of the community in an equitable manner. In creating such a community, the University aims to foster a climate of understanding and mutual respect for the dignity and worth of all persons. Please see the University of Toronto Governing Council "Statement of Commitment Regarding Persons with Disabilities" at http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppnov012004.pdf.

In working toward this goal, the University will strive to provide support for, and facilitate the accommodation of individuals with disabilities so that all may share the same level of access to opportunities, participate in the full range of activities that the University offers, and achieve their full

potential as members of the University community. We take seriously our obligation to make this course as welcoming and accessible as feasible for students with diverse needs. We also understand that disabilities can change over time and will do our best to accommodate you.

Students seeking support must have an intake interview with a disability advisor to discuss their individual needs. In many instances it is easier to arrange certain accommodations with more advance notice, so we strongly encourage you to act as quickly as possible.
To schedule a registration appointment with a disability advisor, please

- visit Accessibility Services at http://www.studentlife.utoronto.ca/as,
- call at 416-978-8060,
- or email at: accessibility.services@utoronto.ca.

The office is located at 455 Spadina Avenue, 4th Floor, Suite 400.

Additional student resources for distressed or emergency situations can be located at distressedstudent.utoronto.ca; Health & Wellness Centre, 416-978-8030, http://www.studentlife.utoronto.ca/hwc, or Student Crisis Response, 416-946-7111.

Equity & Diversity

The University of Toronto is committed to equity and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect. As a course instructor, I will neither condone nor tolerate behaviour that undermines the dignity or self-esteem of any individual in this course and wish to be alerted to any attempt to create an intimidating or hostile environment. It is our collective responsibility to create a space that is inclusive and welcomes discussion. Discrimination, harassment and hate speech will not be tolerated.

Additional information and reports on Equity and Diversity at the University of Toronto is available at http://equity.hrandequity.utoronto.ca.

Course Schedule & Due Dates

(Please note: We are going to do our best to stick to this schedule.
That said, this schedule is subject to change.)

	Date	Lecture	Lab	Assignments & Due Dates
1	01/04	• Introduction to the course & the role of statistics in sociology • Data, variables, samples & populations, level of measurement **Readings** • Agresti & Finlay: 1.1., 1.2, 1.4, 2.1. • Miller: Ch. 1	Introduction to Stata: basic commands, codebook, missing data, do-files **Optional text** • Longest Ch. 1, 2, 3 • Treiman: Ch. 4 (on Quercus)	**Meet with Irene** to get to know each other *(please book a time slot on Quercus in Week 1, for instructions see "Communication & Getting Help")*
2	01/11	Describing data and analyzing distributions: Central tendency and variability **Readings** • Agresti & Finlay: Ch. 3 • Miller: Ch. 2, 4 and 9 (up to the top of page 190)	Summarizing and describing variables in tabular and graphical form, basic data preparation commands **Optional text** • Longest Ch. 4	**Homework 1** due Sun 01/10, 11 a.m.
3	01/18	Describing data and analyzing distributions (continued) & Descriptive bivariate associations **Readings** • Agresti & Finlay: Ch. 9.4 & 10.1 • Miller: Ch. 3 (section on Causality, up to top of p. 40)	Correlation, scatterplots, bivariate tables **Optional text** • Longest Ch. 7 (up to/including the section on "Scatterplots")	**Homework 2** due Sun 01/17, 11 a.m. **Find data set you wish to work with this semester** *(go to "Data" Module on Quercus)* **Book a time slot on Quercus** to meet with Irene or Julia in week 4

	Date	Lecture	Lab	Assignments & Due Dates
4	01/25	Descriptive bivariate associations (continued) **Readings** • Agresti & Finlay: rest of Ch. 9 (all but 9.4) • Miller: Ch. 9 (p. 190-199)	Bivariate regression **Optional text** • Longest Ch. 7 (section on "Linear Regression")	**Homework 3** due Sun 01/24, 11 a.m. **Research Assignment 1** due before class 01/25, 11 a.m. **Meet with Julia or Irene** to discuss your research interests and chosen data set
5	02/01	Overview of sampling, probability theory, and sampling distributions **Readings** • Haan & Godley: Ch. 4 • Agresti & Finlay: Ch. 4	Sampling distribution simulation exercise	**Homework 4** due Sun 01/31, 11 a.m.
6	02/08	Introduction to statistical inference: confidence intervals and hypothesis testing **Readings** • Agresti & Finlay: Ch. 5 & 6	Confidence intervals Drop-in session for research assigment 2	**Homework 5** due Sun 02/07, 11 a.m.
7	02/15	*READING WEEK*		
8	02/22	Using inference to make comparisons: means **Readings** • Agresti & Finlay: Ch. 7 • Miller: rest of Ch. 3 (starting on p. 40)	Hypothesis test: two-sample test	**Homework 6** due Sun 02/21, 11 a.m. **Research Assignment 2** due before class Tue 02/22, 11 a.m.

	Date	Lecture	Lab	Assignments & Due Dates
9	03/01	Using inference to make comparisons: proportions **Readings** • Agresti & Finlay: Ch. 8	Hypothesis test: Chi-square test	**Homework 7** due Sun 02/28, 11 a.m. **Book appointment on Quercus** to meet with Irene or Julia in week 10
10	03/08	Using inference for simple and multiple regression **Readings** • Agresti & Finlay: Ch. 10 & 11	Bivariate and multiple regression	**Homework 8** due Sun 03/07 11 a.m. **Proposal Research Assignment 3** - due before class Tue 03/08, 11 a.m. - Meet with Julia or Irene to discuss project
11	03/15	Further considerations for multiple regression **Readings** • Allison: Ch. 3	How to prepare a succinct and effective research presentation Drop-in session for research assigment 3	**Homework 9** due Sun 03/14, 11 a.m.
12	03/22	Logistic regression **Readings** • Agresti & Finlay: Ch. 15 **Suppemental/optional** • Menard 2002	Logistic regression in Stata	**Homework 10** due Sun 03/21, 11 a.m.
13	03/29	**Research project presentations**		**Research Assignment 3** due Sun 04/04, 11.45 p.m.