SOC6302H | Fall 2018 | Department of Sociology | University of Toronto

Statistics for Sociologists

Instructor: Irene Boeckmann, PhD
Email: irene.boeckmann@utoronto.ca
Office Hours: Wed 3.30-5 p.m. & by appointment
Office: Rm 388 at Sociology Department,
725 Spadina Ave, 3rd floor

Teaching Assistant: TBA
Office Hours: TBA

Class	Tue 2-4 p.m. **Location**: Rm 240
Tutorial	TBA **Location**: FE-36, Basement 725 Spadina Ave.
Quercus	TBA

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, on 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 also get hands-on experience using Stata, a software used to analyze quantitative data.

Statistics seems like a daunting subject for many students. Especially if you haven't used your mathematical 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. While you are expected to be familiar with basic algebraic operations, we will not use derivations and advanced mathematical concepts in this class. We will also focus on learning how to communicate statistical findings effectively to audiences who may not be familiar with the particular statistical techniques applied.

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 during lab sessions.

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

Learning Components & Course Requirements

Readings. Each week, we will read a couple of chapters in the textbook. In selected weeks, texts from other books or journals may supplement the textbook. Ideally, you should read the assigned texts **before each class period** and **review the chapters after the lecture**. Please bring the textbook with you to each lecture and lab session.

Lectures and Class Participation. The lectures will highlight the central concepts in the assigned chapters and illustrate these concepts with examples. We will also use the class time to do practice examples. - It is easy to get lost in a course where we cover a considerable amount of material each week, and where the covered content builds on the material of previous weeks. Regular attendance is therefore crucial. Keeping up with the readings, coming to class and the lab session regularly is important and will help you to stay on track. More than two absences at either lecture or lab may result in a reduction in a student's final grade, usually one-half grade per absence beyond the two (e.g., from A to A-). These grade reductions will be at the instructor's discretion.

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). These assignments will be posted before the class on Tuesdays, and they are due before the next class period the following week at 2 p.m. For the practice examples that cannot be completed online, please bring a hard copy of your answers to class. These 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, Tutorials & Poster Presentations. Over the course of the semester, you will complete 4 research assignments. These assignments will generally have two parts: a) Find 1-2 published articles in your area of interest that use the statistical techniques covered during the preceding weeks and evaluate how they were employed; b) Formulate your own research question and answer this question using survey data and the statistical techniques covered in class. More detailed instructions will be posted on Quercus. The lab sessions are designed to help you learn the skills you need to complete these research assignments. For the last class session, students will prepare posters presenting their work-in-progress for the 4th research assignment.
(*Each of the 1st three research assignments is worth 13%, the 4th assignment is worth 16%, and the poster presentation is worth 5% of the final grade*).

Overview of grade components

		Each worth	Fraction of final grade
10 x	Weekly homework assignments	4%	40%
3 x	Research Assignments 1-3	13%	39%
1 x	Research Assignment 4	16%	16%
1 x	Poster presentation	5%	5%
	Total		100%

Required Materials

Textbook

- Moore, David S., George P. McCabe, and Bruce A. Craig. 2017. *Introduction to the Practice of Statistics*, 9th Edition. New York: W.H. Freeman and Company.

  The 9th edition will be available on course reserves at Robarts library for a 24-hour loan at a time. The 7th edition of the textbook is also available on course reserves at the Mathematical Sciences Library and in Victoria University EJ Pratt Library. The book is available for a 24-hour loan at a time. Note: if you use the 7th edition, chapter numbers differ. Make sure to identify the equivalent chapters assigned to each week.

  Information on purchase options TBA.

Supplemental Texts [Available in Digital Form Through the Library]

- 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]
- 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]
- Any additional readings assigned to selected weeks will be available on Quercus

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.

These optional books will be available for you to look at during the first couple of weeks of class to help you decide whether you would like to purchase a copy for yourself.

- 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]. You can find Stata Learning Modules

Computing and Labs

This course includes a lab component in which we will work through analyses using the Stata statistical program. Data and computer code for the labs will be posted ahead of the lab sessions on the Quercus course page.

Stata is a user-friendly program, ideal for data management, for statistical analysis, and for creating graphical representations of your findings. The program is available in the department's computer labs. 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 15) is available for as little as $75 USD (6th month license), or $198 USD for a perpetual license.

The lab session will offer a first introduction to Stata. 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). Lab sessions will draw heavily from the supplemental text, Using Stata for Quantitative Analysis (Longest, 2015).

Though all labs will be conducted in Stata, students may feel free to conduct their assignments in alternative programs (e.g., R, SAS, SPSS) so long as they include reproducible syntax scripts.

Communication & Getting Help

Email. Please use your **University of Toronto email** to communicate with me with regard to **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 come and talk to us if you have questions about the class material, the assignments or if you have any other concerns with regard to the class.

- The **instructor's regular office hours** are on Wednesdays from 3.30-5 p.m. or by appointment.
- The **TA** will also hold office hours (time and location: TBA).

Late Submission of Assignments & Grade Appeals

Late Submission of Assignments. All assignments are due at the beginning of the following class period, Assignment 4 is due one week after the last class session (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 day the assignment is late (starting with the day the assignment is due).

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 with other students. 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., written interpretation 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 as an appendix. **Students who work together on class work should also indicate whom they worked with on each assignment (if anyone)**. This will guard against situations where a student's academic integrity might be called into question.

Use of Electronic Devices

- Please turn your mobile phone off or on silent before class. In order to avoid distractions, it is strongly recommended that you bring a calculator to class (instead of using your phone as a calculator).
- Students who are using the electronic version of the textbook may bring their laptop to class for the purpose of working with the textbook. Please do not check your email/social media or browse the web during class, as this is not only distracting to you, but also to the students around you.

Course Schedule & Due Dates

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

	Date	Lecture	Lab	Due Dates
1	09/11	• Introduction to the course, the role of statistics in sociology • Data, variables, samples & populations, level of measurement **Readings** • Miller: Ch. 1 • Moore et al.: Ch. 1.1	Introduction to Stata: do-files, basic commands, codebook, missing data **Optional text** • Longest Ch. 1, 2, 3	Nothing due
2	09/18	Describing data and analyzing distributions: Central tendency and variability **Readings** • Miller: Ch. 2, 4 and 9 (up to the top of page 190) • Moore et al.: Ch. 1.2 and 1.3	Summarizing and describing variables in tabular and graphical form **Optional text** • Longest Ch. 4	**Homework 1** due Tue 09/18, 2 p.m.
3	09/25	Describing data and analyzing distributions (continued) & Descriptive bivariate associations **Readings** • Moore et al.: Ch. 1.4 • Moore et al.: Ch. 2.1, 2.2 & 2.3	Correlation, scatterplots **Optional text** • Longest Ch. 7 (up to/including the section on "Scatterplots")	**Homework 2** due Tue 09/25, 2 p.m.
4	10/02	Descriptive bivariate associations (continued) **Readings** • Moore et al.: Ch. 2.4 – 2.7 • Miller: Ch. (p. 190-199)	Bivariate regression **Optional text** • Longest Ch. 7 (section on "Linear Regression")	**Homework 3** & **Research Assignment 1** due Tue 10/02, 2 p.m.
5	10/09	Overview of sampling, probability theory, and sampling distributions **Readings** • Moore et al.: Ch. 3 – 5	Sampling distribution simulation exercise	**Homework 4** due Tue 10/09, 2 p.m.

6	10/16	Introduction to statistical inference: confidence intervals and hypothesis testing **Readings** • Moore et al.: Ch. 6 – 7.1	TBD	**Homework 5** & **Research Assignment 2** due Tue 10/16, 2 p.m.
7	10/23	Using inference to make comparisons: means **Readings** • Moore et al.: Ch. 7.2 & 12 • Miller: Ch. 3	Conducting t-tests and ANOVA	**Homework 6** due Tue 10/23, 2 p.m.
8	10/30	Using inference to make comparisons: proportions **Readings** • Moore et al.: Ch. 8.2, 9.1 &9.2	Chi-square test	**Homework 7** due Tue 10/30, 2 p.m.
9	11/06	Using inference for simple and multiple regression **Readings** • Moore et al.: Ch. 10 & 11	Bivariate and multiple regression	**Homework 8** due Tue 11/06, 2 p.m.
10	11/13	Multiple regression and interaction terms **Readings** Agresti & Finlay. 2009. Statistical Methods for the Social Sciences, Ch. 11 (available on Q)	Bivariate and multiple regression with interactions	**Homework 9** & **Research Assignment 3** due Tue 11/13, 2 p.m.
11	11/20	TBD	TBD	**Homework 10** due Tue 11/20, 2 p.m.
12	11/27	*Poster presentations*		
13				**Research Assignment 4** due Tue 12/11, 11.45 p.m.