SOCIOLOGY 252H1S:

INTERMEDIATE QUANTITATIVE METHODS IN SOCIOLOGY

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Department of Sociology

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Web Site: Quercus

Time and Place:

Class:	Tuesday 6PM-8PM	ES B149
Tutorials:	**Thursday 10AM-12PM, Friday 10AM-12PM,**	FE36, Sociology, 725 Spadina.
T.A.s:	Julia Ingenfeld (Julia.ingenfeld@mail.utoronto.ca)	
	Grace Maich (grace.maich@mail.utoronto.ca)	

Office hours: By appointment

Calendar Description

Provides students with the opportunity to develop an understanding of the logic of multivariate analysis by applying various strategies for the analysis of complex multivariate data.

Prerequisites:

SOC202H1 *or equivalent.* ***Students without this prerequisites will be removed at any time discovered and without notice.***

Overview

Statistics is a powerful tool to make sense of our lives. We see it all around us, for example the recent polls and predictions of our 2019 federal election. Think of statistics as a new language that will allow you to communicate with other scholars, and more importantly, support the arguments you want to make.

This course builds on the knowledge from SOC202 or other equivalent introductory statistics courses. We will further explore using statistical methods to answer sociologically relevant questions. My hope is that, by the end of the course, you will be equipped to ask and answer new and more sophisticated sociological questions using the appropriate statistical methods you will learn in this course.

We begin with simple comparisons of tables and means to build a foundation for further analysis which would require choosing appropriate control variables. We will cover techniques such as ordinary least squares (or linear regression) with multiple independent variables, logistic

regression, interaction effects, hierarchical linear models, and a brief introduction to other advanced statistical methods.

Required Work

There will be two data analysis assignments, in which you will analyze data I provide. The first assignment will be on cross-classification and tables; the second will use multiple regression. I will teach the use of SAS and describe the data you can analyze in scheduled tutorials. There will be some minimal programming your group will do, depending on your choice of variables from the data provided, but I will post very specific templates for what you need to do, so that you can just edit these template programs with the specifics of the variables you choose.

We will not hold tutorials every week. Tutorials will be held on scheduled weeks in the course; these weeks are listed in the class schedule below. In general tutorials are held on weeks prior to due assignments and before tests. The purpose of tutorials is to introduce you to the software to be used in this class (SAS), the data to be used in class and for assignments, and to review assignment questions and test questions in the weeks before required work is due.

The computer lab in Sociology (FE36, in the basement at 725 Spadina) will be open to students in this course at scheduled hours so that students can work on assignments independently. This location will also be available during tutorial hours each week. Public hours for FE36 are:

Tuesdays: 10-12
Tuesdays: 2-4
Thursdays: 12-2

Assignments are written up as short papers meant to analyze a specific research question, following the requirements of the question(s) in the assignment. Results from your computer analyses as well as the syntax you used ***should*** be embedded into your assignment as tables.

There will be two in class term tests. The term tests will focus on questions designed to test your knowledge of interpreting various statistical output and some important conceptual questions (*there will be no essays on either the term test or final exam*). ***Both term tests will be held during regular class time,*** and they are non-cumulative.

Attendance

It goes without saying that your attendance is required. The lecture will provide clarification to the course reading ***and it will include additional information not found in the course reading.*** Tutorials attendance is also required, and to ensure this, we will have 5 short quizzes (less than 30 minutes) which are to be held during tutorial on various dates. You are allowed to miss one of these quizzes without an excuse.

Software

This class will use Stata, which can be accessed during the public hours of FE36 and various locations on campus (https://onesearch.library.utoronto.ca/faq/where-can-i-access-spss-sas-or-

other-statistical-software) at no cost to the student. Should you want to get your own copy of Stata, you can visit https://www.stata.com/order/gradplan-sites/?country=Canada for details.

Data

This year we will use a specific data set for assignments --- TBD.

Due Dates and Weights for Required Work:

Physical copies of assignments will be handed in on the due dates **at the start of class**. These assignments are not to be handed in to departmental staff, fax, or by email. If you cannot make it to class on the dates these assignments are due, you can use the dropbox in room 225 at department of sociology to drop them off. Make sure it is properly timestamped before the start of class – 6PM – (there is a timestamp machine beside the dropbox) to avoid late penalty.

Provisional due dates for required work are as follows:

Work	Date	Weights
1. Tutorial Quizzes (attendance)	Various tutorial dates	10% (4 x 2.5%)
2. First Data Analysis Assignment	Tuesday, January 28	20%
3. Term Test 1	Tuesday, February 11	20%
3. Second Data Analysis Assignment	Tuesday, March 17	25%
4. Term Test 2	Tuesday, March 31	25%

Please note: Late assignments will be given a 10% reduction in the grade immediately, and 10% per day starting from the 2nd day past the due dates. This means that the assignment will be given a weight equal to .90 of the assigned weight. Assignments will not be accepted if they are more than a week late. Your grade will be zero on that part of the course.

Quercus

Quercus will be used in this course mainly for two purposes: 1) I will post data, assignments, Stata examples, and course readings there; and 2) I will post most lecture Power Point materials there – when they are presented in class.

Required Reading:

We will use a collection of academic articles, select book excerpts, and a set of class notes throughout the course. Besides the class notes that you can purchase from 3 cents copy shop for around $15, you are not required to buy a textbook, instead we will use a few online text for some of the topics covered:

- Barbara Illowsky and Susan Dean. Collaborative Statistics. 2008. Connexions: Online (uploaded to Quercus)

Readings:

Besides the required readings, the class schedule includes references to online sources and to posted articles which will supplement the notes used in class. You should especially read

introductory articles for multiple regression and logistic regression. They are intended as basic introductions for audiences who know nothing about these topics. There are also various useful YouTube videos that explain important statistic concepts with real life examples. You are welcome and to consult them, but use at your own discretion.

Student Accommodations

Please see me if you have a disability or other need that requires accommodation or classroom modification. I will be glad to help you in whatever way I can.

Missed Deadlines or Tests

Medical Issues: Please note that requests for medically based exemptions for the assignment deadline must be accompanied by a U. of T. medical form, signed in legible handwriting and completely filled out with address and CPSO registration number. The original form must be given to me in person, within 5 business days, with the opportunity for me to make a Xerox copy. Forms that are scanned or xeroxed will not be accepted.

In case of illness, you must supply a duly completed Verification of Student Illness or Injury form (available at www.illnessverification.utoronto.ca). A doctor's note is also acceptable but MUST contain the start date and anticipated end date of the illness. The form must be placed in a sealed envelope, addressed to the instructor, and submitted with your work at class or to your TA during their office hours.

If a ***personal or family crisis*** prevents you from meeting a deadline, you must get a letter from your college registrar. The letter must be placed in a sealed envelope, addressed to the instructor, and submitted with your work at class or to your TA during their office hours.

Term Test

If you miss the term test, you must follow one of the procedures above to qualify for a make-up test. The T.A. will ***not*** run a make-up test separately for each individual. There will be one sitting arranged for all qualified students for a make-up test.

Academic Integrity

Cheating and misrepresentation will not be tolerated. Students who commit an academic offence face serious penalties. Avoid plagiarism by citing properly: practices acceptable in high school may prove unacceptable in university. Students are expected to know and adhere to the University's principles of academic integrity. Any act of plagiarism or other unethical behavior will be addressed in accordance with University guidelines. Students should be aware that turning in an old paper, or large parts thereof, for credit in a second course, is considered an academic offense. Please see the "Code of Behaviour on Academic Matters" (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm) for specific information on academic integrity at the U of T.

I have attached a copy of the academic checklist at the end of this document. **Please print, sign, and submit it to your TA during the first scheduled tutorial.**

Accessibility

If you require accommodations or have any accessibility concerns, please visit http://studentlife.utoronto.ca/accessibility as soon as possible.

Appointments

I encourage you to email me to arrange an appointment if you would like to meet with me. In general, I will be on campus on Thursdays and Friday (subject to change). I will designate special office hours in the weeks before assignments are due – to be announced later.

Make-up Tests

Missing a test will result in receiving a mark of zero, UNLESS within **five business days** the missed test, students who wish to write the make-up test give the instructor a written request for special consideration which explains why the test was missed, accompanied by proper documentation from a physician or college registrar (see above). A request should be accompanied by contact information (the student's telephone number and email address) so the date, time and place of the make-up test can be communicated to the student. A student who misses a test and the subsequent make-up test for a valid reason will not have a third chance to take the test. Instead, the grade assigned for the missed test will be the same as the grade the student earns for the other test in this course.

Re-marking

We will use specific marking keys for both assignments and tests. Those keys define the universe of possible answers and possible variations in those answers. In a course such as this, the only issue that may come up is a mistake in applying the key to the answers in specific cases. If there is a mistake in an assignment or test you get back, you should see the T.A. ***within two weeks of your receipt of the test or assignment.*** In general, we will not consider work for re-grading after feedback on a later test or assignment, unless it is in this two week period.

Class Schedule and Readings

Date	*Topic*	*Readings*
January 7	Introduction: • Levels of measurement, • Sample & Population, • Descriptive Statistics, Probabilities, • Central Limit Theorem, Estimations, and Models□	**Required**: - Raftery, A. E. (2001). Statistics in Sociology, 1950-2000: A Selective Review. Sociological Methodology, 31, 1-45. (1) - Wheaton, B. 2003. "When methods make a difference". Current Sociology. 51(5) 543-72. *Recommended***:** - Xie, Yu. 2007. "Otis Dudley Duncan's Legacy: The Demographic Approach to Quantitative Reasoning in Social Science." Research in Social Stratification and Mobility 25(2):141–56.
January 14	Descriptive Statistics: • Central tendencies, • Central limit theorem, • Tests for means and proportions	**Required:** - Collaborative Statistics (7.1, 7.2, 7.4) - Class notes (P. 37-39) *Recommended***:** - Fisher, M. J., & Marshall, A. P. (2009). Understanding descriptive statistics. Australian Critical Care, 22(2), 93-97. - Rees, D. I., Argys, L. M., & Brewer, D. J. (1996). Tracking in the United States: Descriptive statistics from NELS. Economics of Education Review, 15(1), 83-89.
January 21	Linear Regression I: • Normal distribution, • Association/correlation/ causation • Bivariate tables/bivariate regression	**Required:** - Collaborative Statistics (6.1 – 6.4) - Class Notes (P. 40 – 55, 69 - 80) *Recommended***:**

		- Normal distribution (https://www.mathsisfun.com/data/standard-normal-distribution.html) - The Normal distribution (http://www.stat.yale.edu/Courses/1997-98/101/normal.htm)
January 28	Linear Regression II: • Multivariable regression and inference	**Required:** - Class Notes (P. 86 – 101) - Collaborative Statistics (12.1 – 12.8) *Recommended*: - Olsen, M. E. (1972). Social participation and voting turnout: A multivariate analysis. American Sociological Review, 317-333. - McPherson, M., Smith-Lovin, L., & Brashears, M. E. (2006). Social isolation in America: Changes in core discussion networks over two decades. American sociological review, 71(3), 353-375.
February 4	Linear Regression III: • Confounding • Mediation • Moderation/interaction • Interpreting results	**Required:** - Class notes (P.135 – 146) - Umberson, D., Williams, K., Thomas, P. A., Liu, H., & Thomeer, M. B. (2014). Race, gender, and chains of disadvantage: Childhood adversity, social relationships, and health. Journal of health and social behavior, 55(1), 20-38. *Recommended*: - Thorne, H. 1991. "Modeling and testing interactive relationships within regression analysis". Historical Social Research 16, 4: 21-50. - Coulton, C., and Chow, J. 1992. "Interaction effects in multiple regression". Journal of Social Service Research 16, 1-2: 179-199.
February 11	Linear Regression IV: • Gaussian assumptions • Diagnostic • Goodness of fit	**Required:** - Goodness of fit in Linear Regression (http://www.medicine.mcgill.ca/epidemiology/joseph/courses/EPIB-621/fit.pdf) - Testing the assumptions of linear regression (http://people.duke.edu/~rnau/testing.htm) *Recommended*:

		- Goodness-of-fit Test (https://newonlinecourses.science.psu.edu/stat504/node/60/)
February 17	**READING WEEK**	
February 25	**Test #1**	
March 3	Non linear relationships: • Dummy Variable approach • Quadratic	**Required:** - Class notes (P. 147 – 151, P.154 - 158) *Recommended*: - Uzzi, B. (1997). Social structure and competition in interfirm networks: The paradox of embeddedness. Administrative science quarterly, 35-67.
March 10	Logistic regression I	**Required**: - Class Notes (P. 169 – 177) - Morgan, S. P., & Teachman, J. D. (1988). Logistic regression: Description, examples, and comparisons. Journal of Marriage and Family, 50(4), 929-936. *Recommended*: - Baker, J. O., & Smith, B. G. (2009). The nones: Social characteristics of the religiously unaffiliated. Social Forces, 87(3), 1251-1263.
March 17	Logistic regression II: • Ordinal logistic regression • Multinomial logistic regression	**Required:** - Chapter 12 | Multinomial and Ordinal Logistic Regression - In: Best Practices in Logistic Regression. By: Jason W. Osborne (https://methods.sagepub.com/book/best-practices-in-logistic-regression/i2018.xml) *Recommended*:

		- Johnson, D. R., & Creech, J. C. (1983). Ordinal measures in multiple indicator models: A simulation study of categorization error. American Sociological Review, 398-407. - Winship, C., & Mare, R. D. (1984). Regression models with ordinal variables. American sociological review, 512-525.
March 24	More advanced methods in sociology: • Panel/Longitudinal Analysis • HLM • Structural equations	**Required**: - Ma, X., & Klinger, D. A. (2000). Hierarchical linear modelling of student and school effects on academic achievement. Canadian Journal of Education/Revue canadienne de l'éducation, 41-55. - Bauer, T. K. (2002). Educational mismatch and wages: a panel analysis. Economics of education review, 21(3), 221-229. - Tokar, D. M., Withrow, J. R., Hall, R. J., & Moradi, B. (2003). Psychological separation, attachment security, vocational self-concept crystallization, and career indecision: A structural equation analysis. Journal of Counseling Psychology, 50(1), 3. *Recommended***:** - Curtis, J. E., Baer, D. E., & Grabb, E. G. (2001). Nations of joiners: Explaining voluntary association membership in democratic societies. American Sociological Review, 783-805. - Osborne, J. W. (2000). The advantages of hierarchical linear modeling. - Bollen, K. 1989. Structural Equations with Latent Variables. New York: Wiley. (5) - Allison, Paul D. 2009. Fixed Effects Regression Models. Los Angeles, C.A.: Sage. (3)
March 31	**Test #2**	

Academic Integrity Checklist

SOC252 H1S: Intermediate Quantitative Methods in Sociology

Instructor: Chang Z. Lin

I, _____, affirm that this assignment represents entirely my own efforts.

I confirm that:

- □ I have acknowledged the use of another's ideas with accurate citations.
- □ If I used the words of another (e.g., author, instructor, information source), I have acknowledged this with quotation marks (or appropriate indentation) and proper citation.
- □ When paraphrasing the work of others, I put the idea into my own words and did not just change a few words or rearrange the sentence structure
- □ I have checked my work against my notes to be sure I have correctly referenced all direct quotes or borrowed ideas.
- □ My bibliography includes only the sources used to complete this assignment.
- □ This is the first time I have submitted this assignment (in whole or in part) for credit.
- □ Any proofreading by another was limited to indicating areas of concern which I then corrected myself.
- □ This is the final version of my assignment and not a draft.
- □ I have kept my work to myself and did not share answers/content with others, unless otherwise directed by my instructor.
- □ I understand the consequences of violating the University's academic integrity policies as outlined in the *Code of Behaviour on Academic Matters*.

By signing this form I agree that the statements above are true.

If I do not agree with the statements above, I will not submit my assignment and will consult the course instructor immediately.

Student name: _____ Student #: _____

Signature: _____ Date: _____