SOCIOLOGY 300H1F:

APPLICATIONS OF QUANTITATIVE METHODS IN THE SOCIAL SCIENCES

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Time and Place:

Class: Thursday 12-2   ES4001

Tutorials: Wednesday 12-2 (NOT weekly)   FE36, Sociology, 725 Spadina Ave., Basement

T.A.   *Andreea Mogosanu (andreea.mogosanu@mail.utoronto.ca)*

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 and one SOC course at the 200+ level. **Students without this/these prerequisite/s will be removed at any time discovered and without notice."***

Overview

This course is a follow-up to a first methods course that includes some introduction to descriptive and inferential statistics and the logic of multivariate analysis. We begin by going back to go forward, reviewing some material on the fundamental building blocks of statistical theory and statistical inference.

We will look at tables to establish the nature of association and the logic of controlling for variables, and then introduce regression and correlation, and multiple regression. Multiple regression is a universal technique used in most disciplines that apply quantitative data: it is very flexible, and accommodates most styles of thinking and theorizing.

Near the end of the course, we will consider the extensions of this model that reflect its flexibility, including interaction effects between variables (intersections), nonlinear relationships, and logistic regression for dichotomous outcomes.

Required Work

There will be two computer 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. *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. The general 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.

Important: **This year the first assignment will be done in pairs. You will form pairs voluntarily. Grades will be given at the group level and will apply equally to both students. Note the second assignment will be done individually.**

This year, the computer lab in Sociology (FE36, in the basement) will be open to students in this course at scheduled hours so that students can work on assignments independently.

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 can be embedded into your assignment as tables.

There will be an in-class term test, and a final exam during the scheduled exam period. The term test will focus on problems, including some calculation and/or interpretation, but will also include some conceptual questions. *This test will be held in the tutorial room*. The final is non-cumulative, and will include material only from the section on correlation and regression forward.

Software

This year, by special arrangement, this class will have free access to SAS, the largest statistical software package in use around the world.

You will be able to install SAS on your laptop, given the following conditions: 1) you have a 64-bit laptop; 2) you use Windows 7 or later; 3) you have either Boot Camp or Parallels installed on your Mac. We will be using SAS version 9.4.

The software may not install successfully on older laptops. In these cases, we have SAS installed on the machines in FE36, and you can use those machines to complete assignments.

Data

Two data sets will be available for assignments:

1. The National Survey and Families and Households (1988-2002), a longitudinal survey of a national representative adult sample of the United States followed for 15 years. The final sample is 4060.
2. The 2013 General Social Survey for Canada. This is a long-term survey run every year by Statistics Canada on a representative sample of Canadians 15 and over. The sample size is 27,695.

We will provide derived versions of these data with already constructed variables, except in one or two cases (on purpose, so you see what is involved in programming).

Due Dates and Weights for Required Work:

Physical copies of assignments will be handed in on the due date before 5 pm at the Department of Sociology, at 725 Spadina Avenue, room 225. These assignments are not to be handed in to

departmental staff, or by email, but should be handed in by deposit in the 300-level box in Room 225 designated for course work, **using the date/time stamp machine**.

Provisional due dates for required work are as follows:

Work	Date	Weights
1. First Assignment	Thursday, October 13	25%
2. Term Test	Wednesday, October 26	20%
3. Second Assignment	Thursday, November 24ʰ	25%
4. Final Exam	exam period	30%

Please note: Late assignments will be given a 10% reduction in the grade immediately. This means that the assignment will be given a weight equal to.90 of the assigned weight. This increases to 20% if the assignment is late more than 3 days. Assignments will not be accepted if they are more than a week late. Your grade will be zero on that part of the course.

Blackboard

Blackboard will be used in this course primarily for two purposes: 1) I will post data, assignments, SAS examples, and other course materials there; textbook there; and 2) I will post most lecture Power Point materials there – when they are presented in class.

Required Reading:

Class Notes

There is set of notes covering all topics in this class that will be sold through Three Cent Copy, on the west side of Spadina, in the block south of Bloor. These notes are assigned reading. The cost is usually around $10 to $12.

Texts:

As a student at the University of Toronto, you have online access through the library to this text:

Larry D. Shroeder et al. Understanding Regression Analysis: An Introductory Guide. Beverley Hills, CA: Sage Publications. 1980.

This is a free online text. It will be uploaded on Blackboard.

Barbara Illowsky and Susan Dean. Collaborative Statistics. 2008. Connexions: Online.

Readings:

Besides the notes and the short text on regression, 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.

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 7 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 not acceptable. 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. This should be submitted to me or a T.A. within 5 business days after the period of illness noted in the form.

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

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.

Appointments

I generally do not hold specific office hours. I encourage you to email or phone me using the number on the first page and arrange an appointment at any time. I am in my office on most days. But, in general, I will be in my office from 3-5 on Mondays after this class, if you want to stop by.

I will designate special office hours in the weeks before assignments are due – to be announced later.

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	Day	Topic / Work	Readings
September 15	Thursday	**1. Overview** **Review of Descriptive Statistics**	**Notes: Basic Statistics Review sections:** **1. Measurement** **2. Sampling** **3. Descriptive Statistics** **Collaborative Statistics:** **1. Sampling and Data 1.1 to 1.10** **2. Descriptive Statistics 2.1 to 2.4, 2.6 to 2.10**
September 22	Thursday	**2. Probability and Inference**	**Notes: Review of Basic Statistics sections:** **4. Introduction to Probability** **5. Probability and Sampling Distributions** **6. More Sampling Distributions** **7. Tests of Hypotheses** **Collaborative Statistics:** **3. Probability 3.1 to 3.4** **5. Continuous Random Variables 5.1 and 5.2** **6. The Normal Distribution 6.1 to 6.6** **7. The Central Limit Theorem 7.1 to 7.5** **9. Hypothesis Testing 9.1 to 9.4, 9.7 to 9.10**
September 28	Wednesday	**Tutorial: Intro to SAS**	**Notes**
September 29	Thursday	**3. Cross-Classification: Studying Association in Tables**	**Notes: Cross-Classification Sections:** **1. Bivariate Associations** **2. Measures of Association in Tables** **Collaborative Statistics:** **3.5 Contingency Tables**
October 5	Wednesday	**Tutorial: SAS Procedures, Class Data Assignment #1**	**Notes**
October 6	Thursday	**4. Multivariate Tables**	**Notes: Cross-Classification Section:** **3. Multivariate Tables**

			Online: **https://onlinecourses.science.psu.edu/stat504/node/102** **Lesson 5.1, 5.2, 5.3**

October 13	Thursday	**5. Introduction to Correlation and Regression**	**Notes: Intro to Correlation and Regression Sections:**
			    1. Correlation
			    2. Bivariate Regression
			    3. Partitioning of Variance
			    4. Bivariate Regression in SAS
			
			Text:
			Schroeder Understanding Regression Analysis:
			    Chapter 1:. Linear Regression
			
			Blackboard:
			    Alan Sykes. An Introduction to Regression Analysis. Pp. 1-7.

October 19	Wednesday	**Tutorial: Test Review**	

October 20	Thursday	**6. Multiple Regression**	**Notes: Multiple Regression Sections:**
			    1. Covariance Equations
			    2. Multiple Regression Examples
			
			Texts:
			Schroeder Understanding Regression Analysis
			    Chapter 2: Multiple Regression
			
			Blackboard:
			    Alan Sykes. An Introduction to Regression Analysis. Pp. 7-17.

October 26	Wednesday	**Term Test**	

October 27	Thursday	**7. An Introduction to Models**	**Notes: Multiple Regression Sections:**
			    2. From Equations to Models
			    3. Causal Interpretation
			    4. Interpreting an Association using Controls and Mediators

November 3	Thursday	**8. Dummy Variables in Regression**	**Notes: Dummy Variables and the Analysis of Variance Sections:** **1. Understanding Dummy Variables**

			2. Two-Way Analysis of Variance (ANOVA). **Texts:** **Schroeder Understanding Regression Analysis** **Chapter 4: Dummy Variables**

November 10	Thursday	**9. Regression Extensions:** **Interactions**	**Notes: Variations in Regression Section:**
			    1. Interactions
			
			Blackboard:
			    Thomas Brambor et al. 2005. Understanding Interaction Models. Political Analysis 13: Pp. 1-11.

November 16	Wednesday	**Tutorial: Assignment 2**	

November 17	Thursday	**10. Regression Extensions:** **Nonlinear Regression**	**Notes: Notes: Variations in Regression Sections:**
			    2. Nonlinear Regression
			    3. Interpretation

November 24	Thursday	**11. Intro to Logistic Regression I**	**Notes: Logistic Regression Section:**
			    1. Logistic Regression
			
			Blackboard:
			    Chao-Ying Peng et al. 2010. An Introduction to Logistic Regression Analysis. Journal of Educational Research 96: Pp. 1-9.

November 30	Wednesday	**Final Exam Review**	

December 1	Thursday	**12. Logistic Regression II**	**Notes: Logistic Regression Sections:**
			    2. Logistic Regression in SAS
			    3. Logistic Regression Examples