

POL322H1F: Introduction to Quantitative Reasoning

University of Toronto
Fall 2013

Meeting Room: UC 140
Meeting Time: L0101: Monday, 12:00–2:00pm
L5101: Monday, 6:00–8:00pm

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Office hours: Wednesday, 2:00–4:00pm

Course Description and Objectives

Quantitative empirical analysis has become increasingly an important part of political science research — and social sciences in general — and public policy debates. The results of statistical analysis on quantitative data, such as opinion polls, election results, and government spending, can be seen in many research articles and books on political science and various reports on divergent policy issues published by governments, think-tanks, non-profit organizations, and news media. Ability to properly understand and critically assess the results of quantitative statistical analysis has become an invaluable asset for any individuals who are interested in a wide range of political, economic, social, and policy issues. This course introduces important foundations of these quantitative empirical studies.

By the end of the semester, you are expected to have a sound understanding of:

1. Representative research strategies to investigate the *causal* relationship of political phenomena of interest (a.k.a. *research design*), and various threats to the validity of different research designs;
2. How to use statistics to learn about the characteristics of a large population from a relatively small sample (a.k.a. *statistical inference*) — e.g., how to learn the opinions of the entire Canadian citizens from a sample of a few thousands;
3. How to conduct, interpret, and critically assess a *regression analysis* — arguably the most basic method used in quantitative social science research.

With these knowledge, students will be better prepared to be educated readers and active participants of social science research and public policy debates. The class is divided into three parts, each of which corresponds to each course objective outlined above.

By nature, the class will involve intensive study of theory and workings of quantitative methods; however, the application to political science research and hands-on experience of data analysis will be emphasized throughout the course. Accordingly, there will be many political science examples and ample opportunities for in-class exercises and group assignments of actual data analysis.

Required Textbooks

Paul M. Kellstedt and Guy D. Whitten, *The Fundamentals of Political Science Research, Second Edition* (Cambridge University Press, 2013).

Alan Agresti and Barbara Finlay, *Statistical Methods for the Social Sciences, Fourth Edition* (Prentice Hall, 2008).

These textbooks are available at the UofT BookStore. All other readings on the syllabus will be made available through the class Blackboard site.

Grading and Evaluation

The final grade will be based on the following items:

1. Three Group Assignments: 36% (12% each)

In each of the three group assignments, you will be randomly assigned to a group of three to five students — you will be in a different group for each assignment — and will complete and submit a short-essay that addresses a set of questions corresponding to each of the three parts of the class. One essay per group is to be turned in. Each assignment is designed to facilitate your understanding of the materials and give you an opportunity to practice applying the concepts and methods you will have learned in the class. The last two assignments will involve actual data analysis. These assignments are also intended to provide you with an opportunity to discuss important concepts and methods with your peers to facilitate mutual-learning.

2. Four Quizzes: 24 % (6% each)

There will be four quizzes which will assess your understanding of the class materials — one on the first part, two on the second, and the last one on the third part of the class subjects. All the quizzes will be conducted through the class Blackboard site. The quizzes will be open-book, open-note tests, so you can consult your own notes, lecture slides, and textbooks; however, you are NOT allowed to discuss or work on the quiz questions with your classmates or other individuals.

3. Final Exam: 40%

Final exam will be a closed-book, closed-note test on the course materials covered throughout the semester. The exam will take place during the final examination period in December administered by the Faculty of Arts and Sciences. Its date and place will be determined and announced by the Faculty.

Blackboard / Learning Portal

The class [Blackboard](#) site (or [the Learning Portal](#)) will be the primary means through which class announcements and assignments will be distributed. Readings other than the above textbooks, lecture slides, and datasets used in lectures and assignments will be made available in the class Blackboard site as well. Its Discussion Board will be the primary method by which you will ask

questions about the course materials and get them answered (more on this below). It will be your responsibility to obtain access to the class Blackboard site and regularly check it.

Lecture Slides

Lecture slides will be made available before each lecture by 10:00am of the day of the lecture through the class Blackboard site. A few important bullets and/or slides may be deliberately taken out. For example, slides used in class may list important questions and their answers, but the answers may not be included in the slides posted on the class Blackboard site.

Computer Software

Quantitative social science research requires the use of computers. For the last two group assignments, you will use a software package called R, which is free to download at <http://www.r-project.org> and is already installed on many UoT computers, to conduct data analysis. In particular, you will use a user-friendly add-on called R Commander, by which you can implement all the statistical procedures you need for your assignments by simply choosing an appropriate command from a pull-down menu. Detailed instructions for how to download and install R and R Commander on your personal computer and how to use the software for each step of the assignments will be handed out separately on the class Blackboard site.

Discussion Board, Office Hours, and Email Policy

You are welcome to visit during the instructor's office hours, which will be held during the time and date specified at the beginning of the syllabus, if you have any questions on class materials. If you have a schedule conflict with the instructor's regular office hours, you are welcome to send the instructor an email to set up an appointment.

We will also use the Discussion Board in the class Blackboard site as the main medium through which you can ask questions regarding class materials and get answers. Given the nature of the course materials and a large size of the class, someone else may have the same question as yours and s/he would benefit from your posting the question and getting an answer through the Discussion Board. You are also encouraged to post an answer to the questions posted by your classmates on the Discussion Board so that we can maintain a mutually-supporting learning community from which all of you benefit. The instructor will regularly check the Discussion Board (at least once in two working days) and answer questions which have not been adequately addressed by peers. For more complex questions or those that would require an extensive treatment, you are best advised to visit the instructor's office hours.

The large size of this class makes it necessary for me to maintain a strict policy with respect to email communications with the instructor. If you have questions of personal nature (e.g., accessibility, appointment, deadline extension), you may email the instructor and expect a response within two working days. Please start the subject heading of your email with "POL322:..." I will not answer, however, any questions over email that are of substantive nature concerning the class materials. You will need to post those questions on the Discussion Board or visit my

office hours to get them answered.

Please note that I will not be able to answer email or Discussion Board questions during weekends.

In the case of your questions of substantive nature on the Discussion Board or those of personal nature over email not answered within two working days (excluding weekends), send me an email to let me know they have not been addressed. Please include "POL322: Unanswered Question" in the subject heading of your email.

Turnitin

Normally, students will be required to submit their course essays to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site.

Students who wish to not use Turnitin.com may make an alternative arrangement with the instructor. They will need to let the instructor know well before the deadline of each assignment and ask for the alternative way to submit the essay. They will be required to save every version/draft of their essay electronically, and submit all of them at the time they submit the essay. They will also be required to hand in all notes, outlines, and bibliographic research at the same time.

Grade Appeals

Grade appeals must be received within one month from when the grade is assigned. When you make appeals, you are required to submit a documentation substantiating why you believe your grade is not appropriate.

Late Penalties

All work is late if submitted after the date and time specified as the due date.

- ▷ Group essays handed in late will result in a penalty of 20 percentage points reduction per day (e.g., from 90% to 70%). Submitting an essay within 24 hours from the due date and time will be considered one day late; submitting after 24 hours but before 48 hours will be two days late, and so forth. Essays handed in more than five calendar days late will receive a zero grade.
- ▷ Quizzes not completed before the due date will receive a zero grade.

To ensure fairness, this policy will be strictly enforced. Note that computer-related problems will not be an acceptable excuse for submitting your work late. For this reason, I strongly suggest you avoid a last-minute submission of your assignments and quizzes through the class Blackboard site.

Extension

Extension may be made only when there is a legitimate reason, such as an unforeseeable medical emergency, and there is an acceptable official documentation, such as the UofT Medical Certificate, the College Registrar's Letter, and the Accessibility Services Letter. Students who know in advance they will need an extension for a legitimate reason should contact the instructor as early as possible before the deadline. Those who missed the deadline for a legitimate, unforeseeable reason should contact the instructor as soon as possible and no later than one week after returning to class.

Conflict with work schedule, leaving for a non-academic trip, or vacation is not an acceptable excuse to miss an exam, quiz, or any other assignments. I suggest you consult the course schedule in advance and drop the course if you cannot be present for the lectures and assignments.

Accessibility

The University of Toronto is committed to accessibility. If you require accommodation for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact [Accessibility Services](#) at (416) 978-8060 or www.accessibility.utoronto.ca as soon as possible.

Academic Integrity

Academic integrity is fundamental to learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T degree that you earn will be valued as a true indication of your individual academic achievement, and will continue to receive the respect and recognition it deserves.

You are expected to be familiar with [the Code of Behaviour on Academic Matters](#), which is the rule book for academic behaviour at the U of T. Potential offences include, but are not limited to, plagiarism, cheating on tests and exams, fraudulent medical documentation and improper collaboration on marked work.

The University of Toronto treats cases of academic misconduct very seriously. All suspected cases of academic dishonesty will be investigated following the procedures outlined in [the Code](#). The consequences for academic misconduct can be severe, including a failure in the course and a notation on your transcript. If you have any questions about what is or is not permitted in this course, please do not hesitate to contact me.

Teaching Assistants

There will be two teaching assistants for this course, whose main duties are grading class assignments and exams. They will also be made available for student contact for specific purposes, which will be announced later in the course. When you contact the teaching assistants, please follow the guidance set forth later.

Class Schedule

Class schedule and the assigned readings for each lecture are specified below. During the semester, the lecture schedule may be adjusted according to the actual progress of the class. If this is the case, the due dates of assignments and quizzes may also be slightly modified. In addition, some assigned readings may be replaced by others. If these are to happen, you will be given an advance notice during lectures.

Part I: Basics of Quantitative, Empirical Political Science Research

Week 1 (Sept. 9): Introduction: What Will We Learn and Why?

Steve Lohr, "[For Today's Graduate, Just One Word: Statistics](#)," *New York Times* (August 6, 2009): A1.

Week 2 (Sept. 16): How Can We Study Politics Scientifically?: Scientific Study of Politics and the Evaluation of Causal Relationship.

▷ **Assignment #1 posted.**

Kellstedt and Whitten, Chapters 1 and 3 .

Week 3 (Sept. 23): How Do We Know Our Theory is "Right"?: Research Design, Experiments, and Observational Studies.

Kellstedt and Whitten, Chapter 4.

The following readings are assigned to illustrate different research designs. I don't expect you to read them in detail. Instead, I suggest you skim through them to get a big picture of how the authors designed their empirical research to answer the causal question of their interest.

- **Laboratory Experiment:** Joel Turner, 2007, "[The Messenger Overwhelming the Message: Ideological Cues and Perceptions of Bias in Television News](#)," *Political Behavior* 29 (December 2007): 441-464.
- **Field Experiment:** Leonard Wantchekon, 2003, "[Clientelism and Voting Behavior: Evidence from a Field Experiment in Benin](#)," *World Politics* 55 (April 2003): 399-422.
- **Survey Experiment:** Megumi Naoi and Ikuo Kume, 2011, "[Explaining Mass Support for Agricultural Protectionism: Evidence from a Survey Experiment During the Global Recession](#)," *International Organization* 65 (Fall 2011): 771-795.
- **Observational Study:** Andrew Gelman and Gary King, 1990, "[Estimating Incumbency Advantage without Bias](#)," *American Journal of Political Science* 34 (4) — Introduction and Sections 1, 5 (pp.1150-1152 only), 6 and 8 only.

▷ **Assignment #1 due, Sept. 29 11:59pm.**

Part II: Statistical Inference

Week 4 (Sept. 30): How Can We Make Sense of Our Data?: Descriptive Statistics and Visualization

▷ **Quiz #1 posted.**

▷ **Assignment #2 posted.**

Kellstedt and Whitten, Chapters 5.1, 5.7-5.12 and 7.4.3.

Agresti and Finlay, Chapters 1, 2.1-2.3 and 3.

▷ **Quiz #1 due, Oct. 1, 11:59pm**

Week 5 (Oct. 7): How Do We Know about the Population from a Sample? — Basics: Probability Distribution and Sampling Distribution

Kellstedt and Whitten, Chapter 6.

Agresti and Finlay, Chapters 2.3 and 4.

Thanksgiving Holiday (Oct. 14)

▷ **Assignment #2 due, Oct. 20 11:59pm.**

Week 6 (Oct. 21): How Do We Know about the Population from a Sample? — Application: Point Estimation and Interval Estimation

▷ **Quiz #2 posted.**

Agresti and Finlay, Chapters 5.1-5.3 and 5.6.

▷ **Quiz #2 due, Oct. 22, 11:59pm**

Week 7 (Oct. 28): Is Our Finding “Significant”? : Hypothesis Testing, and Statisticcal and Substantive Significance.

Agresti and Finlay, Chapters 6.1-6.3, 6.5 and 6.8.

Part III: Regression Analysis

Week 8 (Nov. 4): Inferring the Relationship between Two Variables: Bivariate Linear Regression Model

▷ **Quiz #3 posted.**

▷ **Assignment #3 posted.**

Kellstedt and Whitten, Chapters 8.1-8.3, 8.4.4-8.4.7 and 8.5

Agresti and Finlay, Chapters 9.1-9.3.

- ▷ **Quiz #3 due, Nov. 5, 11:59pm**

Fall Break (Nov.11-12)

Week 9 (Nov. 18): Adding More Variables: Multivariate Linear Regression and Model Specification.

Kellstedt and Whitten, Chapters 9.1-9.6 and 10.1-10.3.

Agresti and Finlay, Chapter 11.1 and 14.5-14.6.

Alan Abramowitz, 2008, "[Forecasting the 2008 Presidential Election with the Time-for-Change Model](#)," *PS: Political Science and Politics* 41 (October 2008): 691-695.

Robert Jackman, 1987, "[Political Institutions and Voter Turnout in the Industrial Democracies](#)," *American Political Science Review* 81(2): 405-424.

Week 10 (Nov. 25): What Could Go Wrong?: Outlier, Omitted Variable Bias, and Variation of Multivariate Relationship

Kellstedt and Whitten, Chapters 9.7-9.9 and 10.4.

Agresti and Finlay, Chapter 10.

- ▷ **Assignment #3 due, Dec. 1 11:59pm.**

Week 11 (Dec. 2): A Few More Words on the Linear Regression Model

- ▷ **Quiz #4 posted .**

Kellstedt and Whitten, Chapters 8.4.1-8.4.3., 8.5.

- ▷ **Quiz #4 due, Dec. 3, 11:59pm**

Week 12 (Dec. 4): Examining a Choice: Logit/Probit Model for a Binary Dependent Variable

Kellstedt and Whitten, Chapter 11.2.

Kenneth Benoit and Michael Marsh, 2008, "[The Campaign Value of Incumbency: A New Solution to the Puzzle of Less Effective Incumbent Spending](#)," *American Journal of Political Science* 52 (4)

- ▷ **Final Exam, December** Date and location TBA by the Faculty of Arts and Sciences. The exam will be on the class materials of the entire semester (Parts I – III).

Syllabus Change Policy

The policies and contents of this syllabus may be changed by the instructor with advanced notice. If any, such a change will be announced during lectures.