

# POL322H1S: Introduction to Quantitative Reasoning

University of Toronto  
Winter 2014

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

Instructor: Kenichi Ariga  
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## 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 interpret a *linear 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 will be emphasized throughout the course.

## **Required Textbook**

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

The textbook is available at the UofT BookStore. All other readings on the syllabus will be made available through the class Blackboard site.

## **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 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. There will be an important update to the class Blackboard site at least once a week.

## **Lecture Slides / Study-Guide Questions**

Lecture slides will be made available about a week before the day of the lecture on the class Blackboard site. I advise you to regard these lecture slides as part of the required readings for the upcoming lecture, as the slides and the assigned textbooks/readings will work to complement each other. It is also advisable to print out the lecture slides and bring them to the class. Please note that occasionally a few slides to be presented in the lecture may be taken out from those available on the class Blackboard site. You will be notified of this during lectures if it would happen.

In addition, a list of study-guide questions for each lecture will be made available together with the lecture slides on the class Blackboard site. Use these questions to guide your preparation for the upcoming lecture. You may also use these questions to review the materials covered in each lecture.

## **Grading and Evaluation**

Your grade of the course will be based on the four problem sets and one essay assignment with the following weights:

Problem Sets 1 & 2: 15% each (30% total)

Problem Sets 3 & 4: 20% each (40% total)

Essay Assignment: 30%

The four problem sets will assess your understanding of the class materials. All the problem sets will be posted and your responses will be submitted through the class Blackboard site. Each problem set has questions that focus on the subjects covered immediately prior to it, but it also has questions which are cumulative. By completing these problem sets, you are expected to

progressively build knowledge on quantitative empirical methodology in political science.

In your essay assignment, you will be given an opportunity to practice applying the concepts and methods of quantitative empirical methodology for political science research that you will have learned in the class.

## **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 the 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.

## **Late Penalties**

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

- ▷ Essay assignments 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.
- ▷ Problem sets not completed before the due date will receive a zero grade. As you will be able to work on the problem sets online through the Blackboard, whatever you will have completed before the due date and time will be considered your submission and graded. There may be a single opportunity later in the course in which those who failed to complete any of the first three problem sets may make up their missed grades albeit with 20 percentage points reduction (i.e., the maximum point you would receive is 80% of the problem set you will have missed). This make-up opportunity will be similar to the problem sets in its format and may be offered in the last two weeks of the semester. Note that this make-up opportunity will be given only once so that you may not be able to make up more than two missed problem sets.

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 problem sets and an essay 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 the assignments. I suggest you consult the course schedule in advance and drop the course if you cannot be present for the lectures and assignments.

## **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.

## **Teaching Assistants**

There will be two teaching assistants for this course, whose main duties are grading assignments and student contact regarding the assignments. When you contact the teaching assistants, please follow the specific guidance set forth later.

## **Outside Class Communication Policy**

The large size of this class makes it necessary for me to maintain the following policy with respect to outside-class communication with the instructor and teaching assistants. Please follow the policy specified below when you contact the instructor or teaching assistants outside class.

### **1. Office Hours**

- ▷ 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 the class materials.
- ▷ There will also be office hours held by a teaching assistant later in the course. Specific schedules of the teaching assistant's office hours will be announced later on the class Blackboard site.

### **2. Discussion Board**

- ▷ We will also use the Discussion Board on the class Blackboard site as the main medium through which you can ask relatively simple 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 will benefit. The instructor will regularly check the Discussion Board (once on Mondays, Wednesdays, and Fridays) and answer questions which have not been adequately addressed by peers.
- ▷ While relatively simple questions may be posted on the class Discussion Board, you are best advised to visit the office hours for complex questions or those that would require an extensive treatment.

### **3. Email Communications**

- ▷ If you have any questions of personal nature (e.g., accessibility, deadline extension for legitimate reasons), 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.

### **4. Essay Assignment**

- ▷ There will be extra office hours during the two weeks prior to the due date of the essay assignment held by a teaching assistant. If you want to discuss or seek advice on the essay assignment, please stop by these extra office hours.
- ▷ If you want to seek advice on your essay assignment yet have a schedule conflict with all available office hours, another teaching assistant will be available for feedback over emails during the same weeks. (This is the only exception to the email communications policy described above.)
- ▷ Please consider visiting regular office hours of the instructor or extra office hours by a teaching assistant first, as the feedback of this kind may be best communicated in person. You should consider seeking advice via emails only when your schedule does not allow visiting the available office hours.
- ▷ Please note that neither the instructor nor teaching assistants will be able to review your draft essay when you seek advice.

### **5. Non-response**

- ▷ As stated above, I will not respond to questions of substantive nature over emails. Please make sure that you follow the policy set up above to post these questions on the Discussion Board.
- ▷ Please note that the teaching assistant and 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.

## 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](http://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 offenses 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.

## 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 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 (Jan. 8):** 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 (Jan. 15):** How to Study Politics Scientifically: Scientific Study of Politics and the Evaluation of Causal Relationship.

Kellstedt and Whitten, Chapters 1 and 3 .

**Week 3 (Jan. 22):** How Do We Test Our Theory? Research Design I: Experiments

Kellstedt and Whitten, Chapter 4.1-4.2.

The following readings are assigned to illustrate different types of experiments. 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.

▷ **Problem Set #1 posted, Jan 22**

**Week 4 (Jan. 29) 1st Half:** How Do We Test Our Theory? Research Design II: Observational Studies

Kellstedt and Whitten, Chapter 4.3-4.4.

The following reading is assigned to illustrate observational studies. I don't expect you to read it in detail. Instead, I suggest you skim through it to get a big picture of how the authors designed their empirical research to answer the causal question of their interest.

- 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.

**Part II: Statistical Inference**

**Week 4 (Jan. 29) 2nd Half:** How Do We Make Sense of Our Data?: Descriptive Statistics and Visualization

Kellstedt and Whitten, Chapters 5.1 and 5.7-5.12.

▷ **Problem Set #1 due, Jan. 29 11:59pm**

▷ **Essay Assignment, posted**

**Week 5 (Feb. 5):** Drawing a Random Sample: Probability and Probability Distribution

Kellstedt and Whitten, Chapter 6.

Alan Agresti and Barbara Finlay, *Statistical Methods for the Social Sciences, Fourth Edition*, Chapter 4.1-4.3.

- ▷ **Problem Set #2 posted, Feb. 5**

**Week 6 (Feb. 12):** Exploiting Randomness for Our Inference of Unknowns: Sampling Distribution and Point Estimation.

Alan Agresti and Barbara Finlay, *Statistical Methods for the Social Sciences, Fourth Edition*, Chapter 4.4-4.7.

- ▷ **Problem Set #2 due, Feb. 12, 11:59pm**

### **Reading Week (Feb. 18-21)**

**Week 7 (Feb. 26):** How Much Are We Confident in Our Inference?: Interval Estimation.

Thomas H. Wonnacott and Ronald J. Wonnacott, *Introductory Statistics for Business and Economics, Fourth Edition*, Chapter 8.1-8.2, 8-5.

- ▷ **Essay Assignment due, Feb. 26, 11:59pm**

**Week 8 (Mar. 5):** Is Our Finding “Significant”?: Hypothesis Testing, and Statistical and Substantive Significance.

Janet Buttolph Johnson and H.T. Reynolds, *Political Science Research Methods*, Chapter 12.

- ▷ **Problem Set #3 posted.**

**Week 9 (Mar. 12):** How Do We Know about the Population from a Sample?: Statistical Inference Review.

Review the reading assignments in Weeks 5 to 8.

### **Part III: Linear Regression Analysis**

**Week 10 (Mar. 19):** Modeling the Relationship between Two or More Variables: Bivariate and Multivariate Linear Regression Model.

Kellstedt and Whitten, Chapters 8.1-8.2 and 9.1-9.2

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

- ▷ **Problem Set #3 due, Mar. 19, 11:59pm**
- ▷ **Problem Set #4 posted**

**Week 11 (Mar. 26):** Inferring the Relationship between Two or More Variables: Statistical Inference for Linear Regression.



Kellstedt and Whitten, Chapters 8.3-8.4, 9.4, 9.6 and 9.8.

**Week 12 (Apr. 2):** How Do We Use a Linear Regression in Political Science Research? Several Applications.

Readings TBA.

▷ **Problem Set #4 due, Apr. 4, 11:59pm**

### **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.