UNIVERSITY OF CALGARY

SCHOOL OF PUBLIC POLICY

PPOL 603 – Foundations II- Empirical Foundations
Course Outline

Course:	PPOL 603 Foundations II Empirical Foundations	**Term:**	Fall 2016
Time:	August 22-26, 2016 Monday to Friday 9:00-12:00 and 1:30 to 4:30	**Section:**	01
		Place:	Nexen Technology and Conference Center, DTC (Downtown Campus: 5th Floor, 906-8th Avenue SW)
Instructor:	Daniel Dutton		
Office:	5th floor of DTC	**Telephone:**	
Office Hours:	After class or by appointment	**E-mail:**	daniel.dutton@uleth.ca

Required Textbooks:

Statistical Reasoning for Everyday Life, J.O. Bennet, W.L. Briggs, M.F. Triola, 3rd or 4th Edition, Addison Wesley, 2013

Recommended Textbook(s):
Struck by Lightning: The Curious World of Probabilities, J.S. Rosenthal, Harper Perennial, 2006

Additional readings and supplemental material will be made available via links posted on Desire2Learn.

Desire2Learn:

Desire2Learn (D2L), a web-based course management tool, will be used in the course. Students registered in this course can log in at: https://d2l.ucalgary.ca/. Note that D2L features a class e-mail list that will be used and I will use this list to communicate with you. It is your responsibility to ensure that D2L uses the e-mail address of your choice. The default is your University of Calgary e-mail address.

Course Description:

Evidence based policy making requires information and sensible interpretation of what the information means. This week long course will focus primarily on quantitative data but will also introduce the basics of qualitative analysis. The course will begin with topics addressing data gathering and communication. This involves understanding how sampling and surveys are done, how to present data, and how not to be fooled by misleading presentations of data. Once we examine data, it is natural to ask questions such as, "Are male and female average earnings really different or are the differences we see in the data just arising from the fact we are using small samples?" Trying to answer questions of this sort is referred to as inference, which constitutes the final stages of the course.

The objectives of this course are:

a) To develop an understanding of data collection, data manipulation, data communication, describing data with sample statistics and making inferences with statistical methods.
b) To acquaint the student with the issues around appropriate and inappropriate uses of data for informing policy making.
c) To develop a set of analytical tools to assess and evaluate various policy options.
d) To acquaint students with basic statistical analysis in Excel.

Our main statistical topics will include:

- Data collection (Survey and census data and where they come from). This will include issues relating to the population of interest, how to select a sample to get unbiased estimates, and how to design and implement a survey.
- Indices and percentages. Working with the data to represent relative and absolute movements.
- Data Communication. Graphing and tabular presentations of data. How the presentation can affect the reader's interpretation.
- Sample statistics. How to characterize the data in terms of its central tendency, spread and the shape of its distribution
- Inference. Establishing and testing hypotheses about underlying relationships in the data.

Classes and Readings:

The classes will consist of a combination of lectures, class discussion and application of course concepts through in-class group work. A schedule of class topics and readings is appended to this outline. These may be updated closer to the time of the course and updates will be noted on D2L.

Grade Determination:

5 Assignments (Pass/Fail)   Due dates: Start of Class the next day.

These will be assignments that will be circulated at the end of class each day and due the following morning. The grades for the assignments will be either "PASS" or "FAIL". To pass the course, each student must achieve a "PASS" on all five Assignments.

 Schedule of Topics for 10 Sessions (Each Session is 2.5 hours in duration):

Session 1: Populations, samples and studies

Topics include sampling methods, types of statistical studies and what makes for credible studies
Policy Discussion: From mandatory long form of the census to voluntary survey for 2011
READINGS: Text Chapter 1; David A. Green and Kevin Milligan "The Importance of the Long Form Census to Canada," *Canadian Public Policy/Analyse de politiques* 36(3) 2010: 383-388. Michael R. Veall, "2B or Not 2B? What Should Have Happened with the Canadian Long Form Census? What Should Happen Now?" *Canadian Public Policy/Analyse de politiques* 36(3) 2010: 395-399. Chapter 7: White Lab Coats: What Studies Do and Don't Show in Jeffrey S. Rosenthal *Struck by Lightning: The Curious World of Probabilities* (Toronto: Harper Perennial, 2006).

Session 2: Measurement in Statistics

Data types, levels of measurement, errors in measurement, counts versus rates
Policy Discussion: Measuring Health with QALY's
READINGS: Text Chapter 2, Macgregor article from 679; Chapter 5: Murder Most Foul: Measuring Trends in Jeffrey S. Rosenthal *Struck by Lightning: The Curious World of Probabilities* (Toronto: Harper Perennial, 2006). Maurice McGregor, "Cost-utility analysis: Use QALYs only with great caution," Canadian Medical Association Journal 168(4) 2003: 433-434.

Session 3: Economic Measures, Sources of Error, Index Numbers, Present Value

Topics include measuring policy targets like Standard of Living, Index numbers, and making comparisons or describing changes
Policy Discussion: The Consumer Price Index and quality changes in goods – are cars more expensive today than 20 years ago?
Readings: Text Chapter 2. Matthew Brzozowski, "Does One Size Fit All? The CPI and Canadian Seniors," Canadian Public Policy/Analyse de politiques 32(4) 2006: 387-411.

Session 4: Describing Data

Topics: Measures of central tendency, dispersion and shapes of distributions
Readings: Text Chapters 3 and 4

Session 5: The Normal Distribution and the Central Limit Theorem

Topics include properties of the Normal Distribution, Expected Value, Variance. distribution shapes and the Central Limit Theorem
Policy Discussion: Statistical discrimination and Racial Profiling
Reading: Textbook Chapter 5.

Session 6: Probability in Statistics

Topics include the basics of probability theory, probabilities with large numbers, concepts of risk, insurance, and life expectancy
Reading: Textbook Chapter 6; Chapter 3: Laying Down the Law: Why Casinos Always Win in Jeffrey S. Rosenthal *Struck by Lightning: The Curious World of Probabilities* (Toronto: Harper Perennial, 2006).

Session 7: Correlation, Causation and Lines of Best Fit

Topics include identifying, measuring and interpreting correlations.
Policy Discussions: Does drinking alcohol cause you to earn more? Are sticks or carrots better performance incentives?
Reading: Textbook Chapter 7; Chapter 2: What are the Odds of That? Coincidence and Surprise in Jeffrey S. Rosenthal *Struck by Lightning: The Curious World of Probabilities* (Toronto: Harper Perennial, 2006). Kahneman and Tversky, "On the psychology of prediction," Psychological Review 80 (1973): 237-251. Meyer, Bruce D. (1995) "Natural and Quasi-experiments in Economics*" Journal of Business & Economic Statistics*, 13, 151–161.

Session 8: Estimation – Inferring things about a population from samples

Topics include point estimation, interval estimation, estimating means and proportions.
Policy Discussions: Polls and margins of error
Reading: Textbook Chapter 8; Chapter 10: Fifty-one to Forty-nine Percent: The True Meaning of Polls and Chapter 11: Nineteen Times Out of Twenty: Margins of Error in Jeffrey S. Rosenthal *Struck by Lightning: The Curious World of Probabilities* (Toronto: Harper Perennial, 2006).

Session 9: Hypothesis Testing

Topics include the fundamentals of a hypothesis test, tests of population means, tests of population proportions, Type I and Type II errors
Policy Discussion: Death penalties and criminal convictions;
Reading: Textbook Chapters 9 and 10.

Session 10: Qualitative Studies
Topics: TBA
Reading: TBA

Important Notes:

- The School of Public Policy expects the highest standards of professional conduct by students, faculty and staff. Abusive or disrespectful behavior will not be tolerated. This includes any expression of prejudice in any of its forms.
- It is the student's responsibility to be fully aware of the academic regulations outlined in the University Of Calgary Faculty Of Graduate Studies Calendar. Provisions regarding Student Misconduct (plagiarism, cheating and other academic misconduct) will be strictly enforced. Please review the University of Calgary's Regulations on Plagiarism, Cheating and Other Academic Misconduct, online: http://www.ucalgary.ca/pubs/calendar/current/k-2.html
- Students seeking reappraisal of a piece of graded term work (term paper, essay, etc.) should discuss their work with the Instructor *within fifteen days* of the work being returned to the class.
- Examinations will not be given prior to the scheduled date.
- It is the student's responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Student Accessibility Services, please contact their office at 220-8237. Students who have not registered with the Student Accessibility Services are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than fourteen (14) days after the start of this course. The Student Accessibility Services website is here: http://www.ucalgary.ca/access/
- All material used in this course is for the sole use of the individual and should not be recopied in either print or digital format. For copyright guidelines, including those relating to photocopying and electronic copies, please refer to the Association of Universities and Colleges of Canada (AUCC) fair dealing guidelines. http://library.ucalgary.ca/copyright/fair-dealing
- The University of Calgary complies with the requirements of the *Freedom of Information and Privacy Act*. The University's policy on the sharing of student information with third parties can be found here: http://www.ucalgary.ca/legalservices/files/legalservices/pg-pi-of-students-to-3rd-parties.pdf. The University's policy on the sharing of student information with the subject can be found here: http://www.ucalgary.ca/legalservices/files/legalservices/pg-pi-of-student-to-subject.pdf
- In the event of an emergency, students may be required to evacuate the building. If evacuation is ordered, follow these procedures:

  - Stay calm, do not rush, and do not panic.
  - Safely stop your work.
  - Gather your personal belongings if it is safe to do so. (keys, purses, jackets, cell phones, etc. It may be hours before you are allowed back in the building.)
  - If safe, close your office door and window, but do not lock them.
  - If directed by wardens, follow their instructions.
  - Use the closest emergency exit. Do not use the elevator.
  - Proceed to the designated Emergency Assembly point in front of the Holiday Inn on 8th avenue to the west of the Downtown Campus.

- Do not re-enter the building or work area until you have been advised by emergency responders that it is safe to do so.

Graduate Students' Union Vice-President, Academic
Abu Abdelhafiz
Phone: 403-220-5997
E-mail: gsavpa@ucalgary.ca

Graduate Students Association
214 MLT, 2500 University Dr. NW
Calgary, Alberta T2N 1N4
CANADA
Tel: 403 220-5997
Fax: 403 282-8992

Emergency Assembly Point
Holiday Inn Lobby (weather permitting)
1020 8th Avenue SW
Calgary, Alberta T2P 1J2
Or remain at nearest exit point

Safewalk / Campus Security: 220-5333

****