Course Syllabus

PBAF 527C, Introduction to Quantitative Analysis

Instructor: Ryan Scott, ryscott5@uw.edu
Office hours: Wednesdays, 10AM-12PM, Parrington 411

Teaching Assistant: Shane Johnston, sjohns94@uw.edu
Office hours: Thurs 2:30 - 4:30 in PAR 124E

Introduction

This course is the first in a two-quarter sequence aimed at helping you to become an informed producer and critical consumer of research and statistical analyses. By the end of this course, you will:

- Gain an understanding of research and statistical analyses as approaches to explore, describe, or explain management or policy challenges.
- Use descriptive statistics and statistical inference to address policy or management issues;
- Understand the meaning of analyses using confidence intervals, test statistics, and p-values;
- Recognize the implications of the quality and quantity of data;
- Demonstrate your ability to use statistics software to manipulate data;
- Write about statistical results for a non-technical audience.

In summary, our goal is for you to understand enough theory and have enough experience to intelligently use data to make inferences and conclusions. Furthermore, you will able to digest and critically assess empirical evidence that you may encounter. Throughout the course, we will examine policy questions and related data in order to learn how to apply analytic techniques.

Expectations

I hope you will find this class engaging and useful, and the best way to accomplish this is for each and every student to come prepared for class and ready to help other students learn. We will be working in small groups throughout the quarter. Mostly this will be informal, however, the goal of these groups will be to facilitate every students learning through sharing and building of knowledge as we work towards achieving the course objectives.

This course has adopted the Evans School Community Conversation Norms. Please be aware of these norms in interactions with instructor, the TAs and other students. At the Evans School, we value the richness of our differences and how they can greatly enhance our conversations and learning. As a professional school, we also have a responsibility to communicate with each other—inside and outside of the classroom—in a manner consistent with conduct in today's increasingly diverse places of work. We hold ourselves individually and collectively responsible for our communication by:

- Listening carefully and respectfully
- Sharing and teaching each other generously
- Clarifying the intent and impact of our comments
- Giving and receiving feedback in a "relationship-building" manner
- Working together to expand our knowledge by using high standards for evidence and analysis

Of course, do your own work, and avoid plagiarism and cheating as defined in the Evans MPA Student Handbook.

Textbooks:

Each week there will be three assigned readings. The first reading will be a methods piece, and will provide support in learning and applying the method we use in class. The second piece will be used to provide intuition about how those methods accomplish the end goal. The third piece will push you to think about application of the methods to questions of public policy and governance. For each week, please complete the readings before class. Each week we will use the intuition and application pieces to motivate class discussion, while the methods reading is provided as a support for your application of key concepts on homework assignments. The readings will all be available from the course canvas website.

Generally the methods piece for the week will come from OpenIntro Statistics, a free, online textbook.

Software:

Primary support will be provided in SPSS which you can access via the Evans School Computer Lab, the Evans School Terminal Server, or the CSDE Terminal Server. The homeworks will guide you through SPSS, and the TA will provide support for SPSS, so if you choose to use another program you may not receive the same level of support.

I also highly recommend the possibility of learning a program such as R, Stata, or SAS if you have interest in working in statistical research in the future. There are one-day and free online courses in statistics software that are offered through various on campus venues. If you would like to take one of these courses and write up a 500
word summary of your experience with the software and the differences compared to SPSS, you can receive 5 extra credit points toward your midterm exam grade. Please include with your 500 word write up a brief example of an application of a course lesson (i.e., t-test, confidence interval, descriptive statistic, or graph/figure). We will accept your effort to take an extra course in Tableau, R, SAS, Excel, Python or Stata. These must be submitted by the final scheduled course meeting (March 10). If you cannot find an on campus course, running yourself through a tutorial from http://www.ats.ucla.edu/stat/seminars/default.htm (http://www.ats.ucla.edu/stat/seminars/default.htm) or a similar website is perfectly fine. We ask that you spend at least an hour applying yourself to the software if you choose the self-guided tutorial method.

Grading:

20% Homeworks
25% Midterm
30% Final
25% Project

Final grades will be given on the 4.0 scale per the MPA Student Handbook. While there is no perfect method of transferring over from a percentage scale to the 4.0 scale (see ordered categorical variables), I will post updates following the midterms and during the final week of class as to how the % grade achieved approximately maps onto the 4.0 scale. More info on the grading scale can be found at https://www.grad.washington.edu/policies/general/grading.shtml (https://www.grad.washington.edu/policies/general/grading.shtml), and http://evans.uw.edu/sites/default/files/public/MPA%20Student%20Handbook%2015-16_FINAL_0.pdf (http://evans.uw.edu/sites/default/files/public/MPA%20Student%20Handbook%2015-16_FINAL_0.pdf).

Homework:

For this class there are five homework assignments. Homeworks should be clear and legible, with answers clearly indicated and work shown. Homeworks will be given a minus, check, or check plus owing to completion and correctness. You are welcome to work with others but please submit your own work.

Exams:

There will be a midterm and final exam. The midterm for the course will be given during the 5th week of class and will take the first half of the class time. The final will be given during the University scheduled examination time. Each exam will focus primarily on the material and concepts covered in the preceding 5 weeks of class. The exams will focus on conceptual understandings of course materials. You will have access to an Evans calculator, and will be given a notes sheet with relevant equations.

Project:

The course project will be work of description and inference four pages single spaced in length plus two figures of your creation which you will include in the appendix. You will work with one partner in completion of this task. The project will proceed as follows.

- Find a newspaper/magazine/internet blog article from the last year on a policy-relevant topic of interest which you can investigate using statistical approaches and relying on the PBAF PUMS Database.
- Using the PBAF-PUMS database, design and conduct a statistical analysis for a policy maker that enhances, challenges, or substantiates the topic of the article. This analysis should involve three variables. One of these three variables must be a grouping variable such that you can compare two groups of people. A brief summary of the article you choose, why it is important to your client, and the main variables you plan to use needs to be submitted to Canvas by Friday the 12th of February at 5PM (Week 6).
- Write a four page memo that clearly illustrates the purpose, methods, results, and conclusions of your research. Refrain from using jargon and make your memo readable for a general audience of college educated adults. Include an appendix with two figures, and a statistical supplement including your code/and or a description of the variables you used for your evaluation.
- At least, your memo should demonstrate:
  - Clear documentation of the purpose and method of your research
  - Statistical description of key variables of importance
  - Application of descriptive statistics and inference (at least one t-test, use of confidence intervals).
  - Effective visual description in two figures
  - Understanding of the limits of your research and directions for future investigations
- Finally, your memo must be written for a decision maker who has not attended statistics class in 10 years. Essentially, make your memo readable for a non-technical audience with expertise in your topic.

We will discuss a rubric/format in more detail following the first midterm.

Notation:

Statistics depends on notation. As you read different textual sources, you will come across different methods of notating the same formula. There is already a notes sheet available for the midterm and final that will have key formulas. This is the notation that you should make yourself most familiar with, as the equations will be in this format on your exam notes sheet. If you encounter errors in the notation, please kindly make me and the TA aware of them and we will release corrected versions. The goal of providing the notes sheet is for you to focus on concepts and application, not memorization of statistical procedure, though in time that will follow.
### Schedule:

The course schedule can be found on the home page, with readings under each week. The course materials/schedule are subject to change as necessary. This is true with the lecture notes, which are on Canvas for your convenience in review but do not need to be consulted prior to class.

<table>
<thead>
<tr>
<th>Date</th>
<th>Details</th>
<th>Time</th>
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<tbody>
<tr>
<td>Thu Jan 7, 2016</td>
<td><strong>Week 1 Meeting</strong> (<a href="https://canvas.uw.edu/calendar?event_id=863354&amp;include_contexts=course_1025190">https://canvas.uw.edu/calendar?event_id=863354&amp;include_contexts=course_1025190</a>)</td>
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<td>Fri Jan 15, 2016</td>
<td><strong>Homework 1</strong> (<a href="https://canvas.uw.edu/courses/1025190/assignments/3018582">https://canvas.uw.edu/courses/1025190/assignments/3018582</a>) due by 11:59pm</td>
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<td>Fri Jan 22, 2016</td>
<td><strong>Homework 2</strong> (<a href="https://canvas.uw.edu/courses/1025190/assignments/3018583">https://canvas.uw.edu/courses/1025190/assignments/3018583</a>) due by 5pm</td>
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<td>Fri Jan 29, 2016</td>
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<td><strong>Midterm</strong> (<a href="https://canvas.uw.edu/courses/1025190/assignments/3018588">https://canvas.uw.edu/courses/1025190/assignments/3018588</a>) due by 5:30pm</td>
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<td><strong>Group Project Plan</strong> (<a href="https://canvas.uw.edu/courses/1025190/assignments/3018590">https://canvas.uw.edu/courses/1025190/assignments/3018590</a>) due by 5pm</td>
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<td>Thu Mar 10, 2016</td>
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<td>Tue Mar 15, 2016</td>
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