

PBAF 527u: Quantitative Methods

Th 4:30-7:20, Smith 404

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Course listserv: pbaf527u_wi05@u.washington.edu (if you are registered, you are subscribed)

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Teaching Assistant: Siri Erickson-Brown

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Review Session: W 5-6, location TBA

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

- Gain an understanding of research and statistical analyses as ways to explore, describe, or explain phenomena of management or policy concern;
- Demonstrate your ability to frame a testable research question;
- Use descriptive statistics and statistical inference to address policy or management problems;
- Understand the meaning of analyses using confidence intervals, test statistics, and p-values;
- Recognize the implications of the quality and quantity of data and randomization for the certainty of results and the ability to answer research questions;
- Appreciate the implications of data aggregation decisions for doing analyses, how these decisions may influence analytic results, and, thus, the understanding of policy or management problems;
- Demonstrate both your ability to SPSS to produce results and your capacity to write about those results in a manner that is easily understood by a non-technical policy audience.

In sum, the goal is for you to understand enough theory and have enough experience to intelligently use real world data to arrive at reasonable conclusions in your own analyses. Furthermore, you will be 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.

Text. The text for the course is *Statistics 9th Edition* by James T. McClave and Terry Sincich (Prentice Hall: Upper Saddle River, NJ, 2000). The text is available from the University Bookstore.

Class Notes. I will hand out my notes for the class periodically throughout the quarter. I will also post them to the class website.

Software. We will be mainly using SPSS to complete class assignments, including the policy report. We may also take advantage of Microsoft Excel for some of its statistical functions, using each package for what it does best. Excel usually comes with the Microsoft Office Package. If you want to buy the software, both Excel and SPSS are available from the

University Bookstore Computer Outlet. You can use both Excel and SPSS in the computer lab at the Evans school or at the Center for Social Science Research Computation and Research (CSSCR). CSSCR, located in the basement of Savery Hall, has a help desk that is willing and able to help you with computer and software-related questions.

Recommended resources for SPSS and Excel are *Adventures in Social Research: Data Analysis Using SPSS 11.0/11.5 for Windows* and *Excel Manual: Statistics*. These are available at the University Bookstore.

Some tips about this class:

Study in groups. A good way of learning this material is to discuss the material with someone else. To that end, I recommend you form a study group with whom you review your responses to problem sets prior to handing them in. Set a time regular time to meet. Ask questions among yourselves. Seeing material from the perspectives of others will help you to formulate your understanding of the material. For each homework assignment, you should hand in your own work after having reviewed your responses to the problems with your group. Studying in groups also enhances your class participation grade.

Keep up with the reading and the homework. Try very hard to keep up with material as it is presented to you. In most cases, later learning is highly dependent upon a good understanding of the earlier material. Furthermore, do the reading in the chapter *before* you come to class. Hearing the material after having read it will help things make sense to you. Attend class regularly, keep up with your assignments, and frequent the weekly review sessions.

Ask questions. If you do not understand something, ask questions about it in class or in the review session. Usually, you are not the only one who has the same question. Additionally, asking questions will enhance your class participation grade. Submit questions electronically prior to Wed night at 8pm prior to each class, and I'll attempt to answer them in class the next day.

Requirements:

Homework Assignments. The purpose of the homework assignments is to give you practice in applying the concepts you learn in class and from your reading. Because they are practice, homework assignments are graded with a check, check minus, or check plus. No late homework will be accepted, mainly because on the due date I'll be handing out an answer key.

Class Participation. Your active involvement in the material in class will help you to learn it better. You can participate by engaging in group work during class sessions, asking questions in class, helping to answer other students' questions in class, and by participating in a study group. You can ask questions in class that help you to work on the homework. You can submit questions by email prior to class as you learn the material. For each class, I will ask 5 people to submit to me 2 items by email to facilitate your engagement with the material. First, these folks will submit questions they had after doing the reading or talking to their classmates about the material for that week. Second, they will submit one or two sentences on what they learned from

the reading or their study group. I will assign people to this role after the first day of class—you will receive an email letting you know the schedule.

Exams. This class has a midterm and a final. The midterm will be partially in class and partially take-home. For the midterm, on the scheduled day we will have class for an hour and 20 minutes. The second half of class will be devoted to the exam. Students can stay and work on the exam in the classroom or take it home. In either case, it is due the next day by noon. The final will be available on Thursday, March 16 at 10am and due during the regularly scheduled exam period, Friday, March 17 from 4:30-6:30pm. Both exams will be designed to take no more than 2 hours to complete.

Policy Report. The policy report gives you practice in performing an analysis for consumption by a non-technical audience. We'll discuss the policy report in detail on the first day of class.

Grading:

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|---|------------|
| Homework assignments (complete and on time) | 10% |
| Class Participation | 10% |
| Midterm (open book and notes) | 20% |
| Final (open book and notes) | 20% |
| Policy Report | <u>40%</u> |
| | 100% |

| Date | Topic | Reading | Assignment |
|-----------------------|---|---|---|
| 1. Thursday Jan 6 | <i>Why do research? Why use statistics?</i> Tools: <ul style="list-style-type: none"> • Collecting information and using it to answer questions • Case: Welfare Reform in Washington (from course home page) • Course content • Policy Memo Explained | Chap. 1 | Policy memo assignment handed out HW#1 available on-line |
| 2. Thursday Jan 13 | <i>How do we describe? Describing the middle and variations from the middle.</i> Tools: <ul style="list-style-type: none"> • Displaying data explaining qualitative (categorical) information- pictorial representations • Describing the middle and variations from the middle (Quantitative (continuous) measures) | Chap. 2 sec 2.1-2.7, 2.10 | |
| 3. Thursday Jan 20 | <i>Descriptive statistics, probability, and cross tabs; How can we make statements about the unknown? Why randomize?</i> Tools: <ul style="list-style-type: none"> • Population proportions to indicate bias • Displaying and Interpreting discrete data • Drawing a random sample | Chap. 3, sec. 3.1-3.7 | #1 due #2 available on-line |
| 4. Thursday Jan 27 | <i>Why does the area under the curve equal 1? What is normal?</i> Tools: <ul style="list-style-type: none"> • Using probabilities to estimate the mean • Using the normal curve | Chap. 4, sec. 4.1 – 4.4 Chap. 5, sec. 5.1-5.4, and | #2 due #3 available on-line |
| Tues Feb 1 | <i>Assignment 3 due—hand in Siri's box on the door of 124D Parrington or email by 4:30 pm</i> | | #3 due |
| 5. Thursday Feb 3 | <i>Review; Revisit Policy Memo Assignment; Sample Papers</i> | Example Papers | Midterm Exam |
| 6. Thursday Feb 10 | <i>Why do samples allow us to make inference? How sure do we have to be? How many do I need to be that sure?</i> Tools: <ul style="list-style-type: none"> • Sampling and the central limit theorem • Confidence Intervals • Determining Sample Size | Chap 6 Chap. 7 | #4 available on-line |

| Date | Topic | Reading | Assignment |
|------------------------|--|-------------------------|--|
| 7. Thursday Feb 17 | <i>What the heck is a testable hypothesis, anyway? Framing a research question and a research hypothesis</i> Tool: <ul style="list-style-type: none"> Hypothesis testing for a single mean or proportion. | Chap. 8, sec 8.1-8.5 | Policy Proposal Memo Due #4 due #5 available on-line |
| 8. Thursday Feb 24 | <i>Are these two groups the same? Defining a population, sample, and unit of analysis revisited</i> Tools: <ul style="list-style-type: none"> Hypothesis testing with two means or proportions | Chap. 9, sec 9.1-9.4 | |
| 9. Thursday Mar 3 | <i>Bringing it together: What is the relationship between research, hypotheses and statistics?</i> <ul style="list-style-type: none"> Case Application | TBA | #5 due |
| 10. Thursday Mar 10 | Case Application and Review Discussion of Policy Reports Evaluations | TBA | Policy Report Due at start of class |
| Thursday Mar 16 | Final Exam available | | 10 am final exam available |
| Friday Mar 17 | Final Exam due | | 4:30-6:30 final exam due |