

Data, Models, and Decisions II (PAD 505)
(A.K.A. Introductory Statistics)
Fall, 2015

Department of Public Administration and Policy
Rockefeller College of Public Affairs and Policy
University at Albany (SUNY)

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I. Overview:

Statistics are ubiquitous in our daily lives and are essential for achieving the holy grail of “evidence-informed policy” and yet all too often the interpretation of research results are made unnecessarily inaccessible to critically minded audiences through an over-emphasis on the mathematics of statistics versus the practice of doing statistical analysis. The goal of this course is to develop a basic level of statistical literacy that will allow students to critically examine research evidence on important policy and public administration issues. This includes making students better consumers of news stories that cite empirical studies, reports put out by think tanks and other sources of policy analysis and original research studies published in academic journals.

The course is designed as an introduction to the use of descriptive and inferential statistics in policy analysis and management. Students are not expected to have studied statistics previously, but basic competency in mathematics and algebra is assumed. Students who wish for a more mathematically oriented introduction to statistics primarily through probability theory are encouraged to investigate appropriate courses in the Department of Mathematics and Statistics.

Topics introduced in this course are covered under four general sections, each receiving approximately equal treatment: summarizing, presenting and cleaning data; sampling theory; study design and advanced data analysis. The approach taken to these topics will be more oriented to application in management and policy making than to an exploration of the theoretical foundations of the field. The emphasis of the class will be on how to actually *do* statistics in real life and correctly interpret results. In this regard, the course will require a great deal of hands on use of computer software, but also less math (for those of you that are a bit math phobic).

Several of the key objectives to be achieved through this course include:

- 1) Developing an appreciation of the importance of statistics in contemporary public inquiry,
- 2) Gaining increased sophistication as a statistical "consumer" who understands the strengths

- and limitations of statistical analysis, and
- 3) Viewing key elements of research design from an administrative perspective in which the costs and benefits of alternative data gathering options are considered.

II. Textbook and Course Materials

We are still looking for an ideal textbook that would cover the material we want to cover in the order we want to cover it. We have identified a textbook (below) that at least provides examples relevant for students of public administration (though less policy relevant examples). In the mean time, we have put together a set of readings that address the major topics covered in the course.

Required Textbook:

Meier, K.J., Brudney, J.L., Bohte, J. (2012). Applied Statistics: For Public and Nonprofit Administration, 8th edition. Sage Publishers.

This is an expensive textbook, but used copies may be available on Amazon or other websites for very cheap.

Supplementary readings will be posted on Blackboard. Be sure to check Blackboard regularly as supplementary readings will likely be updated as the semester progresses.

Suggested Supplementary Textbook:

Gonick L., Smith W. 1993. *The Cartoon Guide to Statistics*. Harper Perennial.

Other Materials: Laptop Computer with a functioning version of Excel. You will need to complete your homework assignments using Excel and ideally I would like for you to bring your laptop to class so you can practice along with the demonstrations I will be doing. Although I cannot require that you bring a laptop computer, I strongly suggest you all bring a laptop so you can practice what we are doing in class with your laptop. I will be demonstrating in class how to do data analysis in excel, SPSS and Stata. Ideally I would have wanted to use the computer lab for this class, but there are none available this term.

III. Course Schedule

<i>Week</i>	<i>Topic</i>	<i>Textbook</i>	<i>Assignments</i>
1 8/31/15	Basics of Research Design and Why We Should Care about Statistics (e.g., hypotheses; generating research questions...)	In-class reading assignment; individual and group work Required: Chapter 1 textbook (up to p. 10) Optional: Chapter 1 Cartoon Guide to Statistics	Complete course pre-survey
9/7/15	<i>No class, Labor Day</i>		
9/14/15	<i>No class, Rosh Hoshanah</i>		
Unit 1: Summarizing, Presenting and Cleaning Data			
2 9/21/15	Descriptive Statistics: Types of Variables, Measures of Central Tendency and Dispersion	Textbook chapters 4,5&6; Cartoon Guide to Statistics ch. 2	Assign 1 Quiz 1
3 9/28/15	Data Summary: Tables and Graphs for different types of data	Diamond & Jeffries, chapters 2 & 3 (Blackboard)	Assign 2 Quiz 2
4 10/5/15	Cross-Tabulations & Measures of Association	Textbook chapters 15&16	Assign 3 Quiz 3
Unit 2: Sampling Theory			
5 10/12/15	From Populations to Samples: Sampling design and theory	Textbook chapter 11 Introduction to political science	Assign 4 Quiz 4

		methods.... Cartoon guide?	
6 10/19/15	Confidence intervals and significance testing for samples: t-test, etc. (How to compare sample stats to a population)	Textbook chapters 13 & 14	Assign 5 Quiz 5
7 10/26/15	Midterm exam?		
Unit 3: Study Design			
8 11/2/15	Study Design: Surveys versus Experimental Designs; Correlation versus Causation	Textbook ch.3, research design Chapter 1, What works in development and accompanying blog post (Blackboard)	Assign 6 Quiz 6
9 11/9/15	Questionnaire construction and cleaning data for analysis	Introduction to Statistics for Political Scientists, ch. X (see Blackboard)	Assign 7 Quiz 7
Unit 4: Advanced Data Analysis			
10 11/16/15	Scatterplots, correlation, assessing causal relationships	Textbook Chapter 17	Assign 8 Quiz 8
11 11/23/15	Simple linear regression & multiple regression	Textbook Chapter 18, 19, 21	Assign 9 Quiz 9
12 11/30/15	Transforming data and data cleaning for regression; creating compound measures	Textbook Chapter 23	Assign 10 Quiz 10
13 12/2/15	Different types of regression (e.g., logistic; time-series)	Textbook Chapter 22	None
14 12/8/15	Final project?		
	Final Exam		

III. Course Requirements:

To allow adequate class time to discuss critical and difficult issues, you must read the required chapters prior to class. Take notes about the parts you have difficulty understanding. Please check your email account and the Blackboard site at least once a week for important updates on class materials.

You are expected to spend at least eight hours each week on this course besides in-class learning. These eight hours should be spent to review textbook chapters, class notes, solutions to example questions, and then finish homework. As part of the course learning, you should pay attention to some policy studies published in newspapers. You may be asked to discuss some policy study examples in class. Some useful information sources are *New York Times* and *Albany Time Union*. As you are reading related articles on a certain policy study, pay attention to their data sources, data collection methods, analytical methodology, results, and their arguments based on the results.

Individual and Group Work. You will be divided into permanent groups throughout the semester and in most classes you will be asked to perform a series of group tasks in addition to individual tasks. This includes taking weekly in-class quizzes individually and in groups.

III. Grading and Assignments:

1. **Weekly in-class quizzes (15 points).** Part of your weekly participation grade will come from in-class quizzes on the readings that will be taken at the beginning of the class. There will be a quiz each week consisting of 2-4 questions unless otherwise specified.

You will first take these quizzes individually and then as a group. Your individual grade will account for 10% and your group grade 5%. We will go over the answers in class that day. The goal of these quizzes is to encourage you to do the reading and come prepared to class. We hope that these quizzes will help you to be a better consumer of knowledge when you read and reinforce the main knowledge set we want you to take away from the course. The lowest 4 quiz grades will be dropped. This includes zeros that you might receive for an unexcused absence from class. If you arrive too late to reasonably complete the quiz, this will also count against you.

2. ***Participation and attendance (15 points)***. Participation and attendance account for 15 points of the grade. Students are expected to attend each class on a timely basis, so that they will benefit maximally from the class lectures, class exercises, and class discussion. Unexcused absences will result in a reduced final course grade. We will assess attendance through the weekly quizzes.
3. ***Homework (100 points)***. Throughout the semester, 10 homework assignments will be given to students. Previous experience proves that weekly practice is the best way to learn analytical skills. Assignments will be graded based on correctness of the results and your calculation process. Please do include the calculation process so you will get partial credits even if the result is not correct. Please combine your work to a single Microsoft Word file for submission.

Assignments should be submitted ONLY through Blackboard. Each assignment is due BEFORE class on the due day. Please make sure that you submit your assignments on time. Late submission will NOT be graded. This policy will be strictly enforced.

4. ***Midterm and final exams (50 points each)***. Each exam is worth 50 points. Exams account for the major part of the grade for this course. Exams are in-class and close-book. You are allowed to bring a letter size (single sided) note card to the exams. You are allowed to bring a calculator. Smart phones and tablets are not allowed to be used in exams. Bringing other materials will be considered cheating and will result in penalties.
5. ***A note about Excel and other Statistical Packages***. The statistics performed in this course can be generated in Excel. You will need to know the basics of Excel. If you are not familiar with the basics, then you need become so. The lectures will cover the steps needed to perform a specific statistical function, but familiarity with the software is required. In addition to learning to perform major tasks in Excel, you will be given demonstrations of how to perform basic data analysis in both SPSS and Stata and we will discuss the relative merits of different statistical packages. All computer support (hardware and software) needed for this course is available in the Dewey Library.
6. ***Grade***: Final grades will be based on class attendance and participation, homework assignments, and exams. Maximum points for each part are as follows:

Participation and discussion	15 points
Weekly assignments	100 points (10*10 points)
<u>Midterm exam & Final Exam</u>	<u>100 points</u>
Total	230 points

Final letter grades will be assigned as followed:

Grade	Minimum Points Earned	Percentage
A	214	93%
A-	207	90%
B+	200	87%
B	191	83%
B-	184	80%
C+	177	77%
C	168	73%
C-	161	70%
D+	154	67%
D	145	63%
D-	138	60%
E	135	59% and below

VI. Other policies

Any form of academic dishonesty will not be tolerated. Please refer to University at Albany's Academic Code at: http://www.albany.edu/content_images/AcademicIntegrity.pdf for the definition of academic dishonesty. Ignorance of these policies will not excuse dishonest conduct. Violations of these standards will result in one of the following penalties or some variant: reduction in the grade for the assignment, failure of the assignment, failure of the course, or expulsion. In all cases, a Violation of Academic Integrity Report will be submitted to the Dean of Graduate Studies to be placed in your university file, with copies provided to you, the department head, and the Dean of Rockefeller College.

Students may appeal a grade on a specific assignment within two weeks of the assignment being returned. To submit an appeal, the student should return the original graded assignment and a letter/memo outlining why you think the grade should be changed. Appeals must be submitted on paper, typed-written. In the appeal, students must identify 1) the specific issue you believe should be reconsidered and 2) evidence from assignment instructions, assigned readings, lectures, or other materials that would indicate your original submission is worthy of a higher grade. Be aware that your grade may go up, down, or remain the same as a result of your appeal.

Seeking problem sets, answers to problem sets, past exams, or past exam answers from

any previous student is prohibited without my expressed, written permission. I will treat such behavior as serious academic misconduct by both the current and past student.

Students with needs consistent with the Americans with Disability Act should inform the instructor during the first week of class so that reasonable accommodations can be made.

Cellphones should only be used in case of emergencies. You can use computer, laptop or tablets only for notes-taking, reading class materials, or doing in-class exercise.

If a midterm examination is missed (with prior approval), its weight in the final grade is added to the final examination. The intersession assignment for each week is due at the beginning of class in the following week. Late assignments will be accepted with a grade penalty of 10% for each passing day; no intersession assignment will be accepted in electronic form. The grade earned by each student does not depend in any way on the distribution of others' grades; there is no penalty for assisting and supporting other students in this course (excepting violations of the academic rules and regulations of this university).