

University of Illinois at Chicago
College of Urban Planning & Public Affairs
Department of Public Administration

Fall 2010

PA 407 – Data Analysis for Public Administration – Section 1

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Time & Place: Monday 3:00 – 6:00 p.m., LC A6

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Introduction

The purpose of this course is to provide you a foundation in basic statistics. The topics to be covered include descriptive statistics, probability theory, statistical inference and hypothesis testing, and an introduction to regression analysis. The objective is to get you comfortable with the tools of statistics and how they may be applied in a public policy/administration setting. The emphasis of this course will be less on formulas and more on teaching you the intuition behind the use of statistics.

Text Book and Reading Materials

The textbook required for this course is *Introduction to the Practice of Statistics*, 5th Edition, by David Moore and George McCabe (abbreviated as IPS), New York: W.H. Freeman and Company, 2006 (ISBN: 0-7167-6400-8).

There is a *Study Guide* available for the textbook (ISBN: 0-7167-6358-3). It provides extended answers to selected problems, and overviews of each chapter. You might want to buy this with several other students and share it. The student CD that comes with the book has some additional datasets used in the book. The website for the textbook is <http://bcs.whfreeman.com/ips5e>.

A statistics software package called *Statistical Package for the Social Sciences* (SPSS) will be used in this course for data analysis. The computers in the university and college computer labs are all equipped with this software. You may wish to purchase or share a book that provides information on how to use SPSS. The recommended one is *SPSS Essentials: Managing and Analyzing Social Sciences Data* (by John T. Kulas, ISBN: 978-0-470-22617-9).

Assignments and Grading

Your overall grade in this course will be based on homework (problem sets) (20%), two midterm exams (20% each), and a comprehensive final exam (40%). Your numeric grade equals $G_{\text{homework}} * 0.2 + G_{1\text{st_midterm}} * 0.2 + G_{2\text{nd_midterm}} * 0.2 + G_{\text{final}} * 0.4$ (G_{homework} , $G_{1\text{st_midterm}}$, $G_{2\text{nd_midterm}}$ and G_{final} are your grades in homework, 1st midterm exam, 2nd midterm exam and final exam, respectively). The overall course grade will be determined based on the numeric grade.

Exams: Course requirements include two midterms and a final examination. In the exams, you will be tested over what has been covered by the exam time. The final exam will be comprehensive. If you must miss one of the exams due to illness, emergency, or religious holiday, you must present me with a letter from your doctor or parents as appropriate. A makeup exam may be arranged.

Problem Sets: You will be given plenty of opportunity to practice the skills learned from this class through weekly homework assignments. The problem sets will be assigned approximately once a week. The problem sets will be due at the beginning of class on the day when they are due. *Handwriting work is acceptable, but must be eligible.* The problem sets are intended to be learning experiences for you. You are encouraged to consult other students, teaching assistant and myself for help with two caveats. First, the work that you turn in must be your own. Second, attempt the problems yourself before consulting others. I will provide electronic answer keys in the Blackboard website.

Computers: While you will learn how to calculate most of the statistics by a calculator, another objective of this course is to teach you how to use a computer to calculate statistics. There will be computer exercises as part of your homework assignments. You will be introduced to the use of SPSS for data analysis. A SPSS manual is very helpful, and the help menu in SPSS also provides significant information to assist you.

Blackboard: We will make heavy use of UIC's Blackboard system for communications. For example, I will use it to make announcements to the class or communicate with you individually. I will also post lectures, reading materials and assignments in the course site. So I strongly encourage you to use the **UIC Blackboard Learning System** on a regular basis. The following website is very helpful for you to learn how to use the blackboard system (<http://www.uic.edu/depts/acc/itl/blackboard/>).

Other Course Policies

Plagiarism: Plagiarism and cheating are taken very seriously and penalized severely. If you are caught plagiarizing an assignment or cheating on an exam, you will receive a grade of "F" for the course – no exceptions. There are further sanctions for academic dishonesty in accordance with university guidelines. Guidelines regarding academic integrity at UIC are available online at the following website: http://www.vcsa.uic.edu/MainSite/departments/dean_of_students/Our+Services/Student+Judicial+Affairs.htm.

Participation by Students with Disabilities: If you need special accommodations in order to meet any of the requirements of this course, please contact me as soon as possible.

Incompletes, later assignments, and extra work: I do not allow students to redo assignments or do extra work to improve their grade. Late submission of assignments will not be accepted unless the student has a legitimate excuse or crisis causing the delay in completing work (i.e. illness, family emergency). Also I will only grant incompletes to students who have legitimate excuses or crisis and who make requests prior to the end of the course.

Study Suggestions

I strongly believe that you cannot learn statistics by “reading” it. You must work out problems. Probably the most effective way of learning is to go through the assigned portions of the textbook prior to class, reread those portions after class and then attempt to do the problems. (By the way, you are *not* restricted to do only those problems that are assigned. Solving others can only sharpen your skills.) Try to do the problems without looking at solutions but, if you run into what seem to be insurmountable difficulties, then you may discuss with your classmates or look at the solutions to help you.

Course Schedule

I. Descriptive Statistics

Lecture 1: August 23rd

Topic: A. Introduction and Overview
B: Visual Displays of Data

Reading:

IPS, Preface: "What Is Statistics?"

IPS, Ch. 1, sec. 1.1

Assignment: Problem set #1 (due on August 30th)

Lecture 2: August 30th (in computer lab SEL 2249)

Topic: Measures of Center and Spread

Reading:

IPS, Ch. 1, sec. 1.2

Assignment: Problem set #2 (due on September 13th)

September 6th, Labor Day Holiday, No Class!

II. Relationships between Two Variables

Lecture 3: September 13th (in computer lab SEL 2249)

Topic: Comparison and Association

Reading:

IPS, Ch. 2, sec. 2.1, 2.2

Assignment: Problem set #3 (due on September 20th)

Lecture 4: September 20th

Topic: A. Least-Squares Regression Line
B. Analysis of Two-Way Tables

Reading:

IPS, Ch. 2, sec. 2.3, 2.4 & Ch. 9, sec. 9.1

Assignment: Problem set #4 (self-checking before 1st midterm exam)

September 27th, Review and 1st Midterm Exam

III. Probability Theory and Distributions

Lecture 5: October 4th

Topic: Randomness and Probability Theory

Reading:

IPS, Ch. 4, sec. 4.1, 4.2

Assignment: Problem set #5 (due on October 11th)

Lecture 6: October 11th

Topic: A: Probability Theory (cont')

B: Probability Distributions

Reading:

IPS, Ch. 4, sec. 4.3, 4.4, 4.5

Assignment: Problem set #6 (due on October 18th)

Lecture 7: October 18th

Topic: A: Normal Distributions

B: Binomial Distributions

Reading:

IPS, Ch. 1, sec. 1.3 & Ch. 5, sec. 5.1 (p. 334-341 & p. 348-350)

Assignment: Problem set #7 (due on October 25th)

Lecture 8: October 25th

Topic: Sampling Distributions

Reading:

IPS, Ch. 5, sec.5.1 (p. 341-347), 5.2

Assignment: Problem set #8 (self-checking before 2nd midterm exam)

November 1st, Review and 2nd Midterm Exam

IV. Inferential Statistics and Hypothesis Testing

Lecture 9: November 8th

Topic: Estimating Confidence Intervals

Reading:

IPS, Ch. 6, sec. 6.1

Assignment: Problem set #9 (due on November 15th)

Lecture 10: November 15th

Topic: Tests of Significance

Reading:

IPS, Ch. 6, sec. 6.2, 6.3

Assignment: Problem set #10 (due on November 22nd)

Lecture 11: November 22nd

Topic: Inference for Distributions

Reading:

IPS, Ch. 7, sec. 7.1, 7.2

Assignment: Problem set #11 (self-checking before final exam)

Lecture 12: November 29th

Topic: Inference for Proportions

Reading:

IPS, Ch. 8

December 6th: Final Examination