

**INTRODUCTION TO DATA ANALYSIS
POLITICAL SCIENCE 585
FALL QUARTER, 2005
DERBY HALL, Room 0125
Monday & Wednesday 6.30-8.18**

SYLLABUS

Lecturer: Dr. Omar Keshk
Office: Derby Hall Room 3085
Office Hours: Monday and Wednesday 5.00-6.18,
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Course Description and Objectives

The purpose of this course is to introduce students to the analysis of data. We are bombarded daily with quantitative (numeric) and qualitative (non-numeric) data in newspapers, magazines, textbooks, on television and in classes. Because of this, the understanding of the foundations of data analysis becomes critical. Not only for understanding the numbers that are presented to us but also to critically evaluate the opinions that these numbers are usually put forth to support.

To this end, this class will first introduce students to the most common methods of summarizing data (*descriptive statistics*). An understanding of how data is summarized is not only important for those wishing to analyze data but is also necessary for understanding the data we are constantly presented with in school, television, etc.. Understanding the different ways that data is summarized will allow the student to judge whether they are being presented with accurate information or having the wool pulled over their eyes. Second, the students will be introduced to how the analysis of data is used to substantiate opinions and/or judgments of phenomena of interest (*inferential statistics*). This is perhaps the most powerful and most dangerous use of data. This class will hopefully lay the foundation for students to become capable consumers and users of data in the future.

Course Readings

Required Readings

Levin, Jack & James Alan Fox. 2006. *Elementary Statistics in Social Research*. Boston: Allyn and Bacon.

This book should be available at the OSU, Long's and SBX bookstores.

Course Requirements and Students Responsibilities

Exams: Two Exams: Midterm 30% and Final (Cumulative) 45%.

Homework/Assignments: Five each worth 5% of final grade.

Warning

No make-ups for missed exams, papers or assignments will be allowed under any circumstances except for valid medical reasons. Students experiencing any medical problems necessitating that they miss an exam must contact me as soon as possible or else they will not be allowed to makeup the missed work. Finally,

all makeup structure is left to the instructor's discretion and may be nothing like the work that was assigned to the rest of the class. No make-ups for papers will be allowed.

NOTE: PROFESSOR RESERVES THE RIGHT TO CHANGE EXAMS DATES DEPENDING ON HOW THE CLASS IS PROGRESSING.

Legal Requirements

Academic Honesty

NO CHEATING WILL BE TOLERATED. All University rules regarding plagiarism and academic dishonesty will be enforced. All cases will be referred to the Committee on Academic Misconduct for adjudication and enforcement. Please note the above are very serious offense and by contract, I must report all instances to the Committee on Academic Misconduct. The University Rules on academic misconduct can be found at

<http://acs.ohio-state.edu/offices/oaa/procedures/1.0.html> . The safest thing is to remember that if you take someone else's ideas, thoughts, opinion, etc. than you must cite them, i.e., give them credit. Always remember better safe than sorry.

Disability

Students with disabilities and requiring special assistance are responsible for making their needs known to instructor as soon as possible. Arrangements for students needing such aid can be arranged. An alternative point of contact is the Office for Disability Services in 150 Pomerene Hall. Their phone number is 292-3307.

Miscellaneous

If students want their exams and their papers after the quarter has ended they must notify the Instructor within two weeks of the beginning of the following quarter. Otherwise, their exams, papers, etc. will be disposed off after the 2nd week of the following quarter

Class Schedule

Introduction to Class, and Data Analysis

September 21 & 26, 2005

Topics: *Introduction to Class, Why Data Analysis & Begin Discussion of levels of measurement.*

Readings

Levin and Fox: Chapter 1.

Describing Data

A) Levels of Measurement, Organizing and Describing Data

September 28 & October 3, 2005:

Topics: *Types of Data (Qualitative and Quantitative), Levels of Measurement (Nominal, Ordinal, and Interval) and Organizing Data (Frequency Distributions, Proportions, Ratios, Cumulative Distributions, Bar Charts, Stem and Leaf Plots, Histograms, Frequency Polygons, and Pie Charts)*

Readings

Levin and Fox: Chapters 1, pp. 8-12 (again), & Chapter 2

B) Summarizing Data: Measures of Central Tendency and Variability

October 5 & 20, 2005:

Topics: *Mode, Median and Mean, Range, Mean Deviation, Variance and Standard Deviation*

Readings

Levin and Fox: Chapter 3 & 4.

Making the Leap from Description to Inference

October 12 & 17, 2005

Topics: *Probability and the rules of Probability, Probability Distributions and what they allow us to do*

Readings

Levin and Fox: Chapter 5 & 6

October 19 & 24, 2005

Topics: *The Normal Curve, Standard Normal Curve Sampling Distributions, Standard Errors and what they allow us to do*

Readings

Levin and Fox: Chapter 5 & 6 (Again).

October 26: Review for First Midterm

MIDTERM : OCTOBER 31, 2005

Inferential Statistics

November 2 , 2005

Topics: *Hypothesis testing using the Normal Distribution*

Readings

Levin and Fox: Chapter 7

November 7, 2005

Topics: *Hypothesis testing using the t-distribution*

Readings

Levin and Fox: Chapter 7

November 9, 2004

Topics: *Difference between Means hypothesis testing*

Readings

Levin and Fox: Chapter 7

November 14, 2005

Topics: *Correlation: What is it and what does it tell us
& Correlation: Testing the significance of the relationship*

Readings

Levin and Fox: Chapter 10

November 16 & 21, 2005

Topics: *Regression: What is it, what does it tell us and how to do it*

Readings

Levin and Fox: Chapter 11

NO CLASS NOVEMBER 23

November 28, 2005

Topics: *Review*

Final Exam: November 30, 2005

GEC STATEMENT

Quantitative and Logical Skills

Goals/Rational:

It is hoped that the student will develop logical reasoning, including the ability to identify valid arguments, use mathematical models, and draw valid conclusions based on quantitative data.

Learning Objectives:

It is hoped that students will develop an understanding of statistics and probability, comprehend mathematical methods needed to analyze statistical arguments, and recognize the importance of statistical ideas.