Data Analysis I – (Political Science 401)

Fall 2013

(This syllabus is current as of August 27, 2013, but is subject to change.)

Instructor: Dr. Noah Kaplan
Class: Tuesday and Thursday, 3:30 – 4:45 pm,
in BSB 1115
Office: 1122B, ext. 6-5156
E-mail: njkaplan@uic.edu
Office Hours: Tuesday and Thursday, 10:45 am – Noon and by appointment.
Course Webpage: TBA & Blackboard

TA: Sam Bassett
Office Hours: Thursdays, 1:30-3 pm.
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The purpose of this course is to introduce graduate students to the fundamentals of statistical analysis. We will examine the principles and basic methods of quantitative research in political science and public policy. The course assumes no mathematical background beyond high school algebra. We will use survey data from the 2012 American National Election Study (ANES) for course assignments and the final paper (information regarding ANES can be found at http://www.electionstudies.org/).

This course covers basic methods of descriptive statistics (counting, measuring, and displaying data to "tell their story") and inferential statistics (generalizations from samples to populations), through the use of multivariate linear regression and path analysis to investigate complicated causal relationships. Computer skills are emphasized, and we provide support in the use of Stata, a popular and powerful statistical software package. The course provides the foundation for Data Analysis for Political Science II (POLS501). In both courses, the overriding objective is to identify patterns in sample data that can be generalized to populations and that provide insight into the way that social phenomena work.

Class and Lab Sessions: The class meets twice a week on Tuesdays and Thursdays. Some Thursdays will be devoted to working in the computer lab (BSB 4133).

Readings and Assignments: Readings for each class are specified in the attached syllabus. The textbook (Wonnacott and Wonnacott) and the other required books are at the University Bookstore, which is located in the Student Center. The books for this course are:

- Wonnacott and Wonnacott (WW), *Introductory Statistics* (5 ed.) (required)

- Tamas Rudas, *Probability Theory: A Primer* (required)

- Michael Lewis-Beck, *Applied Regression* (required)

- Christopher Achen, *Interpreting and Using Regression* (required)

- James Davis, *The Logic of Causal Order* (recommended)

- Sam Kachigan, *Multivariate Statistical Analysis: A Conceptual Introduction* (recommended)

The course uses computers for many of the assignments. We will be using a statistical program called Stata.

Hardware and software: Stores will be happy to sell you "statistical calculators," but you do not need one. You do need a basic scientific calculator. Look for one with logarithms (a "log" and/or "ln" key) – any machine with this capability is bound to have everything else we need. Such calculators are available for under $15.

We use Stata for Windows extensively in this class; this program is loaded on the computers in 446 PGH, as well as many other computers around the university. You may wish to buy Stata (you can purchase Stata/IC for $189 or Stata/SE for $395 perpetual license; for further information, see http://www.stata.com/order/new/edu/gradplans/gp-direct.html). You do **not** need to own the software; it just gives you the convenience of working at home and/or on a laptop.

Teaching Assistant: One Teaching Assistant is associated with this course. The TA will hold weekly office hours and will be available by appointment on an as need basis. The TA will also run some of the computer lab sessions.

Grading:

- Weekly Assignments (20%)

- Midterm (25%)

- Final Exam (25%)

- Paper (20%)

- Quiz (10%)

Note 1: Problems sets **MUST** be done by each individual. Though each individual must hand in each weekly assignment, I would encourage students to meet to review and discuss the assignments. Assignments must be turned in at the beginning of class on the day that they are due. **NO late work will be accepted**. Graded problems will be returned in lab.

I prefer not to give makeup exams. Students who take make-ups have more time to prepare. Consequently, make-ups are inevitably unfair to students who take the exam on time. Please arrange your affairs so that you can be in class at the time of the examination. If you are prevented from taking an exam on time and I agree to give you a makeup, it will be different from the exam given at the scheduled time. Regularly scheduled exams are designed to be completed in about an hour-and-a-half. Makeup exams will be longer and will require a more thorough understanding of course material to compensate for the additional time the student has to prepare.

Attendance is taken at the beginning of each class period. If you miss more than two classes, your course grade will be reduced by one letter grade for each additional class you miss.

Cheating and Plagiarism: All students are expected to observe the University of Illinois' rules against cheating and plagiarism. See the section on "Academic Integrity/Academic Dishonesty" in the University of Illinois at Chicago's Student Academic Policy Guide (http://www.uic.edu/depts/oaa/SMAAPP/guide.pdf) for a full statement regarding UIC's rules against cheating and plagiarism. The relevant regulations can be found at http://www.uic.edu/depts/dos/docs/StudentDisciplinaryPolicy0809withpagenumbersandcov.pdf. Any violation may result in expulsion from the University. Cheating and plagiarism in this class will be punished to the maximum extent possible.

ADA Statement: The American with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please see http://www.uic.edu/index.html/disability.shtml.

Course Outline for Quantitative Methods I – Political Science 6480

PART I: OVERVIEW OF PROBABILITY AND STATISTICS

Week 1 (August 27 & 29): Overview/Introduction

NOTE: No class on 29th!

Week 2 (Sept. 3 & Sept. 5): Descriptive Statistics

Readings: WW – Chapter 2, Sections 1, 2, 3, 6 & 7;

Week 3 (Sept. 10 & 12): Probability Theory

Readings: WW – Chapter 3, Sections 1-6

Rudas – Pages 1-32

Assignment # 1 Due

Week 4 (Sept. 17 & 19): Probability Distributions, Univariate and Bivariate

Readings: WW – Chapter 4, Sections 1-6; Chapter 5, Sections 1-3;

Rudas – Remainder

Assignment # 2 Due

PART II: STATISTICAL INFERENCE

Week 5 (Sept. 24 & 26): Random Sampling and Populations

Readings: WW – Chapter 6, Sections 1-4; Chapter 7, Sections 1-3

Assignment # 3 Due

QUIZ on the 26th!

Week 6 (Oct. 1 & 3): Confidence Intervals

Readings: WW – Chapter 8, Sections 1-5

Assignment # 4 Due

Week 7 (Oct. 8 & 10): Hypothesis Testing

Readings: WW – Chapter 9, Sections 1-4 & 6

Assignment # 5 Due

Week 8 (Oct. 15 & 17): Measures of Association (e.g. correlation)

Readings: WW – Chapter 15, Sections 1, 2 & 4

Assignment # 6 due

Week 9 (Oct. 22 & 24): MIDTERM - BRING CALCULATORS!

NOTE: The midterm is on the 24th.

The 22nd will be devoted to catch-up and review.

PART III: REGRESSION ANALYSIS

Week 10 (Oct. 29 & 31): Regression Analysis

Readings: WW – Chapter 11, Sections 1-3 and *Applied Regression*

Assignment # 7 Due

Week 11 (Nov. 5 & 7): Simple Regression Model

Readings: WW – Chapter 12, Sections 1-4

Supplemental Readings: *Interpreting and Using Regression*

Assignment # 8 Due

Week 12 (Nov. 12 & 14): Multiple Regression I

Readings: WW – Chapter 13, Sections 1-3

Supplemental Readings: *The Logic of Causal Order*

Assignment # 9 Due

Week 13 (Nov. 19 & 21): Multiple Regression II

Readings: WW – Chapter 13, Sections 4-6

Week 14 (Nov. 26 & 28): Regression Extensions & Thanksgiving

NOTE: Thanksgiving is on the 28th – No class!

Readings: WW – Chapter 14

Assignment # 10 Due on Tuesday Nov. 3rd.

Week 15 (Dec. 3 & Dec. 5): Review and Final Exam

Assignment # 11 due on Tuesday Dec. 3rd.

NOTE: The final exam is on the 5th. The 3rd will be devoted to catch-up and review.

THE FINAL PAPER IS DUE BY 5 pm, Thursday, DEC. 12*th*.