QUANTITATIVE ANALYSIS IN POLITICAL SCIENCE

This course examines the tools and methods available for empirical political research. While its primary objective to help students understand and evaluate the kind of quantitative information presented in tables, graphs, and statistics in political science textbooks and articles and commonly invoked in debates concerning public affairs and public policy, the course also helps develop students' own research skills. It focuses particularly on survey research on public opinion and voting behavior pertaining to U.S. Presidential elections. POLI 300 is intended primarily for students who have not previously taken a course in statistics, and it is not open to students who have previously taken POLI 302.

Reading Available in Book Center

Herbert F. Weisberg, Jon A. Krosnick, and Bruce D. Bowen, *An Introduction to Survey Research, Polling, and Data Analysis*, 3rd ed. (SAGE, 1996)

Course Pack for POLI 300 (Instructor-authored Handouts for POLI 300)

It is not necessary to purchase the Course Pack, as all the Handouts are available (as PDF files) at the course website. Using any (UMBC or non-UMBC) computer, you may read the items on the screen or download and print them. However, the Course Pack is convenient and cheap.

Additional xeroxed handouts, Problem Sets, and Answers and Discussions to Problem Sets will be distributed in class. *This material should be kept together in an organized folder or binder and brought with you to class every day.*

Methodology Requirement in Political Science

Political Science majors should note the methodology requirement for majors stated in the current on-line Undergraduate Catalog. All majors must take one of the following courses: POLI 300, POLI 301 (Research Methods in Political Science), or POLI 302 (Analysis of Political Data). At least one of POLI 300, POLI 301, and POLI 302 is taught each Fall and Spring semester. Students planning to enter graduate study in political science or related fields are strongly urged to take POLI 301 and either POLI 300 or (preferably) POLI 302 and/or a statistics course (e.g., STAT 121 or 351) in addition. Students who plan to take both POLI 300 (or POLI 302) and POLI 301 are advised to take POLI 301 first. Students who plan to take both POLI 300 and a statistics course are advised to take POLI 300 first.

Course Objectives

This is an upper-level course, designed primarily for political science majors in their sophomore and junior years. The general purpose of the course is to develop your understanding of the logic and methods of quantitative empirical inquiry. The course also has these more specific objectives:

(1)   To enable you to understand and evaluate the political or social science results, especially quantitative results presented in the form of tables, graphs, and statistics, presented in other courses and in textbooks and journals, and to critically assess similar information presented in more popular books, newspapers, and magazines.

(2)   To help you better understand and evaluate political and public policy debates, which often rest on quantitative claims and involve the use of statistics, sampling, and causal reasoning.

(3)   To help you develop the ability to do quantitative (and other) research and to make reasonable decisions on the basis of quantitative evidence.

(4)   To familiarize you, at an introductory level, with elementary statistical methods and computer usage for data analysis.

The course requirements and grading system have been designed to measure your accomplishment of these goals. Grades will reflect level of individual achievement relative to student performance in this course over the long run; there are no semester grade quotas.

Expected Preparation for POLI 300

1.   *Political Science*. While POLI 300 focuses on quantitative data analysis methods rather than substantive political science, we will use examples and data pertaining mostly to American politics (especially Presidential elections). The instructor assumes that students have some basic knowledge of American politics (such as that provided by POLI 100).

2.   *Mathematics*. Preparation adequate to take any introductory general education course in mathematics (one such course being required of all students under the GFR/GEP system) is fully adequate for POLI 300. More specifically, the instructor assumes that students under-stand basic arithmetic calculations and elementary algebraic and geometric concepts, such as ratios, percentages, squares, square roots, equations, and graphical relationships. We will graph linear equations of the form $y = a + bx$, but this topic will be reviewed in class.

3.   *Statistics and Calculators*. No prior knowledge of statistical topics is assumed. Students should have calculators to do certain problem sets, and calculators may also be used (but will not be particularly useful) during tests. (***Note***: calculators built into cell phones, PDAs, laptop PCs, etc., ***cannot*** be used during tests.)   It is advantageous to have a "scientific" calculator with some statistical functions. A graphing calculator (with a large LCD screen) may be advantageous, not so much for its graphing capabilities but because you can enter (and review) an entire expression before calculations are carried out.

4.   *Computer Usage*. All students must have UMBC computer accounts and be able to use the Windows PCs in the Student Labs in the Engineering (ENG) Building, the Library, and elsewhere. Some Problem Sets will require you to work in these labs, using the *Statistical Package for the Social Sciences* (SPSS for Windows) to analyze *American National Election Study* (ANES) survey data made available through the Interuniversity Consortium for Political and Social Research (ICPSR) and described in a "Codebook" that may be found in the Course

Pack or on the course webpage. If for some reason you do not already have a UMBC computer account, you should go to ENG 020 to register for one as soon as possible. (Such an account also allows you to do word processing, send and receive e-mail with a UMBC address, and access the World Wide Web.) More detailed handouts pertaining to SPSS and data analysis may also be found in the Course Pack or on the course webpage. The instructor expects that almost all students have had some prior experience with Windows PCs; students without such computer experience should present themselves to the instructor for more detailed guidance.

Course Requirements

(1)   *About eighteen problem sets*, some of which will require you to use networked microcomputers in the Student PC Labs in the ENG Building or elsewhere.

(2)   *Two midterm exams*. (Dates are on the Course Outline but are subject to change.) These exams will combine multiple-choice questions, problems, and brief written answers.

(3)   *A final examination*, which will be comprehensive in nature and based on brief written answers (no problems, no multiple-choice, and no long essays). See the Guide to the Final Exam on the course website.

Makeup exams will be given only if you present a reasonable and timely excuse for not taking the exam at the regular time. Ordinarily, a "timely" excuse is one that reaches me prior to the regular exam time, and the makeup should be arranged and, if possible, completed prior to the next class meeting.

Class Attendance

Regular class attendance is expected and, in almost all cases, will be necessary for successful completion of the course. While much course material will be presented in the form of PowerPoint slides that will also be posted on the course website, considerable class time will be devoted to general discussion, question and answer sessions, working through problems, etc., and not to formal lectures. It is therefore unlikely that you can effectively make up for missed classes by "getting notes" from a fellow student or from the slides posted on the web. The plight of students who repeatedly miss class will not be viewed sympathetically by the instructor.

Problem Sets and Study Groups

The Problem Sets (common in science and math courses but much less common in political science) constitute a key instructional component of the course (and take the place of the fairly extensive reading assignments typical in most upper-level Political Science courses). The Problem Sets provide regular interaction between the instructor and students and, in addition, can stimulate beneficial interaction among students. You should complete the Problem Sets faithfully and turn them in on time. Even though their direct impact on your course grade is fairly small (up to 20%), they have can have a major *indirect* impact by preparing you to do well on the tests and final exam. Problem Sets

will be returned with (sometimes extensive) "Answers and Discussion" handouts attached; supplementary course material will often be introduced in these handouts, which should be read as carefully as any other course material.

It is fully acceptable for students to work on Problem Sets together in study groups — indeed, I encourage such collaboration. However, it is important that *all members* of such groups work *all problems* in a genuinely collaborative fashion. Students who merely "free ride" on the efforts of others may get good grades on the Problems Sets themselves but will not be able to work similar problems when they are on their own in the much more important tests.

Course Grade

Problem sets will normally be collected in and checked off as *completed on time* (or not) and will be returned with attached Answers and Discussion. Many problem sets will graded but not in highly "accurate" fashion. (The components of "accuracy in measurement" will be discussed in Topics #15.) You should pay much more attention to the attached Answers and Discussion than to the grade. You will be given a precise numerical GPA-style grade on each test and the final exam and, in calculating the course grade, the two midterms will be equally weighted and together will count the same as the final exam.

Your course grade will normally be determined as follows:

Problem Sets	20%
First Midterm Exam	20%
Second Midterm Exam	20%
Final Exam	40%

The 20% of the course grade based on Problem Sets will reflect primarily whether you have completed the problem sets faithfully and secondarily your average grade on them. *Failure to take an exam* (or makeup) *will result in a grade of F for the course*, regardless of other grades. Faithful class attendance, constructive class participation, and improvement over the semester can provide a small bonus, but *no "extra credit" work will be accepted*.

Academic Integrity

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook, the UMBC Policies section of the UMBC Directory, or go to **http://www.umbc.edu/integrity**. As noted above, collaborative work on POLI 300 Problem Sets (as opposed to tests) does not in any way constitute cheating and is in fact encouraged.

Office Hours and Messages

I will be available to students in this course in PUP 208 before and after class on most days to answer questions and deal with other problems. If you need to talk with me at more length or in private, my office is PUP 321 and my normal office hours for the Fall 2010 semester will be MW 4:00 – 5:00, with occasional modifications that I will try to announce in class, and with other times by arrangement. If it is important that you see me on a particular day (even during office hours), I recommend that you make a specific appointment. This can often be arranged before or after class. Otherwise I can also be reached in any way listed below. *Communication by e-mail is encouraged for all purposes*.

E-mail	*nmiller@umbc.edu*
Office phone (with 24-hour voice mail)	(410) 455-2187
Political Science Department (to leave message)	(410) 455-2568
Home (if need be, but not after 9:30pm)	(410) 381-3605

If you contact me by email, I will reply to whatever email address you use. However, if you ask about grades or other private information, you must use your UMBC email address. If I initiate email contact with you, I will use your UMBC email address. For this reason and, more importantly, because all official UMBC communications (from the Registrar's Office, Bursar's Office, Financial Aid, etc.) go to your UMBC email address, *you should check your UMBC email on a regular basis*.

Outside Tutoring

Outside tutoring may be available through the Learning Resources Center or, for students with special needs, Student Support Services. While neither the course instructor nor the Political Science Department in any way controls the availability or quality of such outside tutoring, I am quite willing to cooperate with any outside tutors. Students who believe they may need such assistance are strongly encouraged to seek outside tutoring early in the semester.

Course Web Page

There is a course web page at **http://userpages.umbc.edu/~nmiller/POLI300/index.htm** (or go to **UMBC => Academics => Degrees and Programs => Political Science => Faculty => N. R. Miller => POLI 423**), which can be accessed from any computer with an Internet connection. (Note this is not a Blackboard site.) Announcements and backup copies of the syllabus, problem sets, class handouts, PowerPoint slides, and other course material will be posted here. In addition, this page provides links to many data sets, documents, and research organizations, as well as several on-line SPSS tutorials and other resources for POLI 300 and for political research generally. Students sometimes ask substantive questions by email, which I try to answer individually by email. In addition, when the question is of general interest, I post my response on a "Bulletin Board" section of the web page, so that other students can also have ready access to it. The Bulletin Board also includes relevant items from prior semesters; all items are listed in the order they relate to topics on the Course Outline that follows. All students are urged to check the course web page regularly.

COURSE OUTLINE AND ASSIGNMENTS

This outline is tentative and subject to change. Readings should initially be done *prior* to the class day under which they are assigned and should be reviewed thereafter. The numbered Handouts are available in the Course Pack or on the course webpage. Due dates for Problem Sets will be reconfirmed at the time they are distributed (and may be modified by subsequent announcement in class). *Problem Sets turned in late may be penalized* and, in any event, cannot receive credit if turned in after the corresponding Answers and Discussion handout has been distributed in class.

1.   (September 1)   Introduction and Overview

2.   (September 3)   NO CLASS (Instructor attending conference)

I.   SURVEY RESEARCH

3.   (September 8)   Polling and Survey Research

           Weisberg et al., Introduction and Chapter 1

4.   (September 10)   Polling and Survey Research (cont.)

           Handout #1: *Survey Research*
           Weisberg et al., Chapters 2 and 7

5.   (September 13)   Polling and Survey Research (cont.)

6.   (September 15)   Data Processing, Codebooks, and SPSS

           Handout #1A: *SETUPS: NES 1972-2008 Data*
           Handout #1B: *SETUPS: NES 1972-2008 Codebook*
           Handout #1C: *Data Analysis Using SETUPS and SPSS: American Voting*
                     Behavior in Presidential Elections 1972-2008
           Handout #1D: *Using SETUPS 1972-2004 NES Data and SPSS for Windows*
           Weisberg et al., pp. 205-207 and Chapters 15-17
           Problem Set #1A (Introduction to SPSS) distributed

7.   (September 17)   Questionnaire Construction and Coding

           Weisberg et al., Chapter 4
           Problem Set #1B (Questionnaire Design) distributed

8.   (September 20)   Interviewing and Data Collection

           Weisberg et al., Chapter 5

II.   SAMPLING METHODS

  9.   (September 22)   Sampling Procedures

            Problem Sets #1A and #1B due
            Handout #2: *Random Sampling*, begin
            Weisberg et al., pp. 38-49

  10.   (September 24)   Random Sampling Error

            Handout #2: *Random Sampling*, complete
            Weisberg et al., pp. 67-74
            Problem Set #2 (Random Sampling) distributed

  11.   (September 27)   Random Sampling Error (cont.)

  12.   (September 29)   Implementing Random Sampling

            Weisberg et al., pp. 48-67

III.   VARIABLES AND THEIR MEASUREMENT

  13.   (October 1)   Concepts, Variables, and the Unit of Analysis

            Problem Set #2 due
            Handout #3: *Variables*, begin
            Problem Set #3A (Identifying Variables) distributed

  14.   (October 4)   Levels of Measurement

            Problem Set #3A due
            Weisberg et al., pp. 180-183
            Handout #3: *Variables*, complete
            Problem Set #3B (Levels of Measurement) distributed

  15.   (October 6)   Measuring Variables

            Problem Set #3B due
            Handout #4: *Measuring Variables*, begin
            Weisberg et al., pp. 77-96 (review), Chapter 6, and pp. 207-212

  16.   (October 8)   Accuracy in Measurement

            Handout #4: *Measuring Variables*, complete
            Problem Set #4 (Measuring Variables) distributed

IV.   UNIVARIATE ANALYSIS

17.   (October 11)   Frequency Distributions

              Problem Set #4 due
              Weisberg et al., pp. 190-198
              Handout #5: *Frequency Tables and Graphs*, begin
              Problem Set #5A (Frequency Distributions) distributed
              Problem Set #5B (SPSS Frequency Distributions) distributed

18.   (October 13)   Bar Graphs

              Problem Set #5A due
              Handout #5: *Frequency Tables and Graphs*, continue
              Problems Set #5C (Bar Graphs and Histograms) distributed

19.   (October 15)   Histograms
              Handout #5: *Frequency Tables and Graphs*, complete

20.   (October 18)   Catch-Up and Review

21.   (October 20)   FIRST MIDTERM TEST

22.   (October 22)   Measures of Central Tendency (Averages)

              Weisberg et al., pp. 198-202
              Handout #6: *Measures of Central Tendency*
              Problem Set #6 (Measures of Central Tendency) distributed

23.   (October 25)   Measures of Dispersion

              Problem Set #5B due
              Weisberg et al., pp. 202-205
              Handout #7: *Measures of Dispersion*
              Problem Set #7 (Measures of Dispersion) distributed

24.   (October 27)   Percentiles, the Normal Distribution, and Standard Scores

              Problem Set #6 due
              Weisberg pp. 222-225
              Handout #8: *Standard Scores and the Normal Distribution*

V.   BIVARIATE ANALYSIS

25.   (October 29)   Relationships Between Variables

      Problem Set #7 due
      Weisberg et al., pp. 173-180
      Handout #9: *Relationships Between Variables and Measures of Association*,
            begin

26.   (November 1)   Measures of Association

      Problem Set #8 due
      Handout #9: *Relationships Between Variables and Measures of Association*,
            complete
      Weisberg Chapter 12 (skim only)
      Problem Set #9 (Specifying Bivariate Relationships) distributed

27.   (November 3)   Crosstabulation

      Problem Set #9 due
      Weisberg et al., pp. 247-248
      Handout #10: *Crosstabulations*
      Handout #1C: *Data Analysis Using SETUPS and SPSS: American Voting
            Behavior in Presidential Elections 1972-2000*, review
      Problem Set #10 (Crosstabulations) distributed

28.   (November 5)   Scattergrams

      Problem Sets #8 and #10 due
      Handout #11: *Scattergrams*
      Problem Set #11 (Scattergrams) distributed

29.   (November 8)   Crosstabulation Percentages

      Weisberg et al., pp. 248-258
      Handout #12: *Table Percentages and Association Between Variables*
      *Data Analysis Using SETUPS and SPSS: American Voting Behavior in
            Presidential Elections 1972-2000*, review again
      Problem Set #12A (Table Percentaging) distributed
      Problem Set #12B (SPSS Crosstabulations) distributed
      [Weisberg et al., pp. 183-188, is relevant but not required]

30.   (November 10)   Scattergrams and Regression

            Problem Set #11 due
            Handout #13: *Correlation and Regression*, begin
            Weisberg et al., pp. 298-300

31.   (November 12)   Regression and Correlation

            Problem Set #12A due
            Handout #13: *Correlation and Regression*, continue
            Problem Set #13 (Regression and Correlation) distributed

32.   (November 15)   Regression and Correlation (cont.)

            Problem Set #12B due
            Handout #13: *Correlation and Regression*, complete
            Weisberg et al., pp. 300-312

33.   (November 17)   Regression and Correlation (cont.)

34.   (November 19)   Catch-Up and Review

35.   (November 22)   SECOND MIDTERM TEST

VI.   MULTI-VARIATE ANALYSIS

36.   (November 24)   Causal Thinking

            Problem Set #13A due
            Handout #14: *Spurious Association, Causal Relationships, and Multivariate
                Analysis* [distributed in class], begin
            Weisberg et al., pp. 173-180 (review)
            Problem Set #14A (Lurking Variables) distributed [for discussion only]

37.   (November 29)   Spurious Association and Research Design

            Handout #14: *Spurious Association, Causal Relationships, and Multivariate
                Analysis*, continue
            Discussion of Problem Set #14A

38.   (December 1)   Control Variables in Crosstabulation

          Weisberg et al., Chapter 13
          Handout #14: *Spurious Association, Causal Relationships, and Multivariate
              Analysis*, continue
          Problem Set #14B (Multivariate Relationships) distributed
          Problem Set #14C (SPSS Three-Variable Tables) distributed [due Dec. 23]

39.   (December 3)   Multiple Regression

          Weisberg et al., pp. 312-323
          Handout #14 *Spurious Association, Causal Relationships, and Multivariate
              Analysis*, complete

40.   (December 6)   Multiple Regression (cont.)

41.   (December 8)   Catch-Up and Review

          Problem Set #14B due

42.   (December 10)   Catch-Up and Review

43.   (December 13)   Catch-Up and Review)

FINAL EXAM: Friday, December 17, 1:00-3:00 PM, in PUP 208

Tuesday, December 21, by 5:00 PM in PUB 321 or 355 (Mailbox): Problem Set #14C due