IS 620: Advanced Statistical Techniques for International Studies
Spring 2011

CRN 21970
Mondays, 7:10—9:50 p.m.
Batten Arts & Letters 2070

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Spring 2011 Office Hours:
Tuesdays, 2:00 to 5:00 p.m.
Or
By Appointment

Syllabus

Catalogue Description and Objectives

This course provides an introduction to the use of advanced statistical techniques for the analysis of social science data. The basic objective of the course is to give students a working understanding of multivariate analysis, with a particular focus on the techniques and problems associated with multiple regression. Throughout this class, emphasis will be given to the application and interpretation of statistics rather than the theoretical derivation of statistical formulae. Upon completion of the course, students will possess a conceptual understanding of statistical analysis and will be well prepared to utilize statistical techniques in their own work, to understand and evaluate the use of statistics in the work of others, and will have a strong base from which to learn and apply more specialized statistical techniques.

Prerequisites and Expectations

Students must have completed IS 600: Research Methods for International Studies. I also expect students to have a familiarity and comfort with basic mathematics and logic, including relations, functions and operators; and limits, derivatives and differentiation. We will review these concepts as needed during the course.

In addition, students must have an ODU email account and password with which to access course materials and information through the Blackboard system (https://www.blackboard.odu.edu). An email account with an off-campus service provider (such as Gmail) will not provide you the access to materials you need.

Course Materials

You can purchase the Gujarati book at the ODU bookstore or online at http://www.bkstr.com/webapp/wcs/stores/servlet/StoreCatalogDisplay?langId=-1&storeId=14928&demoKey=d&catalogId=10001. You may also find copies for a competitive price at the Dominion Bookstore on Hampton Boulevard. Of course, you may find inexpensive used versions of Gujarati's book on Amazon.com.

Required Book

Gujarati, Damodar and Dawn Porter. 2008. *Basic Econometrics*, Fifth Edition. New York: McGraw Hill. Any version of Gujarati's book since 1996 will suffice.

Recommended Book

George, Darren and Paul Mallery. 2008. *SPSS For Windows Step by Step: A Simple Guide and Reference, 18.0 Updated*, 11th Edition. Boston: Pearson.

Software

We will use SPSS v. 18 this semester. SPSS is a mature, sophisticated yet easy-to-learn statistical software package for which ODU owns a site license. You will find it installed on all campus computer labs.

I recommend you do NOT purchase the student version of SPSS. In the past, SPSS has offered student licenses that feature a stripped-down version of SPSS, with limitations on the number of variables and the number of observations. As a practical matter, the exercises we will undertake this semester will exceed the limitations of the student version. It is not a good investment.

You may also wish to use R v. 2.12.1, an open-source and free software package ("development environment") for statistical computing and graphics. I have not used R extensively and cannot attest to its ease of use, although GPIS students who completed IS 620 last year did use R. They may be willing to share their impressions of the software. You may wish to invest in learning how to use given that it is free. You can download R from http://www.r-project.org.

Course Requirements and Evaluation

Students will receive grades based on four elements:

1. Exercises (30 percent of your grade): The student will complete ten exercises in which you will apply the concepts and methods we study. Starting in week four, I will upload a new assignment and associated data to the Blackboard webpage. You will download the assignment and associated dataset (if any) from the course's Blackboard page. **Each assignment is due the by 9:00 p.m. the Friday night before the next class.** For example, the assignment for week four is due the following Friday, February 4th. This gives you four days to complete the exercise after that week's lecture.

You must submit your exercises to me electronically. **For general guidelines on the composition, presentation, and submission of your weekly exercise, please download a copy of the "General Guidelines" from our Blackboard page**.

2. Literature Review (10 percent): You should select an article or book on international studies with significant statistical content. While this may come from any number of sources, I suggest you focus on studies published in the leading journals with quantitative content (the *American Political Science Review*, the *Journal of Conflict Resolution*, the *American Journal of Political Science*, *International Studies Quarterly*, the *Journal of Peace Research* and *World Politics*). Your critique should be a maximum of 1,000 words. You should append the original article to your critique. In addition to the written critique you will present a brief oral critique to the class. Your oral presentation should be no more than five minutes long. Please do not simply read your written critique; rather, your comments should summarize the main points of your critique.

Your written literature critique should address the following questions: (a) what is the substantive argument of the article? (b) What hypotheses does the substantive argument generate? (c) What operational measures does the researcher use to move from hypotheses to statistical tests? (d) What data is used and where did it come from? (e) What statistical tests are used? (f) What (very briefly) are the statistical results? (g) How effective is the use of quantitative methods in the article? (h) How effective is the presentation of the quantitative methods?

Starting March 14th, each week two students will present their literature reviews to the class. We will choose dates for your literature review during the first class session.

3. Statistics Project (30 percent) **due April 25th:** In this project you will identify a substantive area and specific research question of interest. You will need to find appropriate data and develop the appropriate statistical tests. To find sources of data, I suggest you start with a list of links compiled by Professor Gaubatz, which I reproduce on our Blackboard Webpage.

The maximum length for the paper is 2,500 words (you can use as many pages as you want, so don't try to cram them all into two pages). As always, presentation matters as well as the quality of your statistical analysis and substantive discussion.

Your paper should include the following components:

1. Discuss the substantive problem and why it matters (some reference to the literature will probably be appropriate here, but not a full-scale literature review).
2. Specify your research and null hypotheses.
3. Outline and defend your methodological approach to testing these hypotheses. In particular, you should discuss how you have operationalized the concepts, as well as any data and measurement issues. You should also discuss the statistical tests you will use and why they are appropriate to the problem at hand.
4. Present and discuss the statistical results.
5. Discuss any limitations to the analysis and directions you might go in future work.
6. Your overall conclusions.

4. Final Examination (30 percent): We will have an in-class final exam during the University-designated exam period: **Monday May 2, 2010, from 7:00 to 10:00 p.m**. The exam will be comprehensive. I have not yet written the exam, but it likely will be a short-essay exam, perhaps with a few multiple-choice questions thrown in. I will provide you with more information about the format of the final exam later in the semester.

Grades

The assessment of your performance on exercises, the literature review, the statistics project and the final examination will depend upon four factors. First, I will assess the effectiveness and appropriateness of each work's application of relevant statistical techniques. Second, I will assess the creativity and insight of each work. Third, I will assess the clarity, organization and presentation of each work. Finally, I will assess the degree to which the work satisfies the guidelines, questions, and instructions for each assignment. In general, grades in the A range indicate a student is performing very well, a B grade indicates satisfactory performance, a B– indicates performance below the minimum expected performance of GPIS graduate students, and a C or below indicates work that is not acceptable. Students who receive a B– or below should see me to determine what immediate and significant action we might undertake to facilitate your comprehension and application of the course's material.

There is no grading curve for the seminar. It is hypothetically possible for each student to get an A, or for each to get a C. I grade each student's work on its merits, irrespective of the merit of other students' work.

Based on your on-time completion of the required assignments and your adherence to the University's honor code (see below), I will assign you a final grade from the following grade scale:

Percent	*Final Grade*
94–100	A
90–93	A–
87–89	B+
83–86	B
80–82	B–
70–79	C
60-69	D
0-59	F

Late Work

I will accept late work but will penalize you five percent for each day an exercise or project is late. This includes weekend days. To avoid this penalty, you must obtain from me an extension of the due date no later than 48 hours before the assignment is due, at which time we will agree to a new due date. Generally, I am flexible in granting no-penalty extensions provided you make a request to me before an assignment is due. I nevertheless reserve the final discretion to grant or withhold no-penalty extensions, and will give them only for serious reasons.

Academic Integrity

I encourage you to consider the consequences of academic dishonesty—there is no quicker way to ruin an academic career, to limit your job prospects after graduation, and to assure you never receive a security clearance. Also consider this: even as serious as ODU is about disciplining violations of the honor code, the University will be far more forgiving of transgressions than will be future employers. The consequences of a violation thus will extend well beyond the university's disciplinary process and your time at ODU.

I expect all students to understand and to abide by the University's Honor Code:

> "We, the students of Old Dominion University, aspire to be honest and forthright in our academic endeavors. Therefore, we will practice honesty and integrity and be guided by the tenets of the Monarch Creed. We will meet the challenge to be beyond reproach in our actions and our words. We will conduct ourselves in a manner that commands the dignity and respect that we also give to others." *Old Dominion University Graduate Catalog 2008-2009*, p. 14.

You should understand your rights and obligations, what constitutes a violation of the honor code and academic integrity, what disciplinary procedures and sanctions you may face, and what options I have should I suspect a violation. The College's web page includes information on plagiarism as well as a tutorial on how to avoid plagiarism (see http://al.odu.edu/al/resources/grad.shtml). If you are unfamiliar with the honor code and disciplinary procedures, I suggest you visit the Honor Council's web page (http://orgs.odu.edu/hc/). You may also refer to the Code of Student Conduct, Sanctions, and Disciplinary Procedures in the *Old Dominion University Graduate Catalog 2008-2009*, pp. 14-18.

Finally, California State University-Bakersfield has a good set of resources on academic integrity at http://www.csub.edu/ssric-trd/howto/plagiarism.htm.

I take the Honor Code seriously, and will pursue vigorously the adjudication of any violations I may perceive or suspect. If I suspect a student has committed a violation, I work only with the University Hearing Officer to determine whether or not a violation has occurred. Under no circumstances will I discuss allegations of academic dishonesty with the individual student.

Students with Disabilities

In accordance with the University's policies and procedures, I will work to accommodate students with disabilities. If you require such accommodations, please contact me by email, phone or during office hours as early in the semester as possible.

Sexual Harassment

It is the policy of Old Dominion University to provide students and employees with an environment for learning and working that is free of sexual harassment, whether by members of the same sex or the opposite sex, which is prohibited by Title IX of the Education Amendments of 1972 and Title VII of the 1964 Civil Rights Act. I expect all seminar participants to understand and abide by the University's sexual harassment policy and procedures, as detailed at http://www.odu.edu/ao/eoaa/policies/ sexualpolicy.shtml.

Course Evaluation

The syllabus is a contract between the professor and students regarding course requirements, expectations, and assessment, which establishes my obligations to you in teaching this class. I also take this contract to include your obligation to evaluate the course at the end of the semester. Student evaluations provide important feedback for me, and they are essential for measuring teaching effectiveness in the profession. Chairs and Deans see course evaluations every year in reviewing faculty performance and committees at all levels of the University rely on the evaluations in making decisions regarding faculty retention, promotion and tenure. ODU takes your input very seriously, and a high rate of student response is necessary for a meaningful assessment of teaching effectiveness. Therefore, I ask you commit yourself to filling out the online course evaluation when prompted at the end of the semester.

Course Plan and Schedule

1. January 10th: The logic of statistics and an introduction to SPSS

2. January 17th: NO MEETING (Martin Luther King Jr. Day)

3. January 24th: SPSS Crash Course (**meet in BAL 1013 lab**)

Reading:
Gujarati, Appendix A

Exercise:
#1, due January 28th

4. January 31st: Review: t-tests, chi-square-tests, and ANOVA

Readings:
Gujarati, chs. 1-4
George and Mallery (chs. 8 and 12)
To be distributed on Blackboard

Exercise:
#2, due February 4th

5. February 7th: Review: Regression

Reading:
Gujarati, chs. 5-8

Exercise:
#3, due February 11th

6. February 14th: Relaxing Classical Assumptions, part I: Multicollinearity

Reading:
Gujarati, ch. 10

Exercise:
#4, due February 18th

7. February 21st: Relaxing Classical Assumptions II: Heteroscedasticity

Reading:
Gujarati, ch. 11

Exercise:
#5, due February 25th

8. February 28th: Relaxing Classical Assumptions III: Autocorrelation

Reading:
Gujarati, ch. 12

Exercise:
#6, due March 11th

9. March 7th: NO MEETING (Spring Break)

10. March 14th: Generalized Least Squares

Reading:
Gujarati, pp. 394-398, 477-484

Exercise:
#7, due March 18th

11. March 21st: Logistic Regression, part I: Theory

Reading:
Gujarati, ch. 15

Exercise:
#8, due March 25th

12. March 28th: Logistic Regression II: Assessing Relative Effects

Reading:
Gujarati, pp. 613-614
Gary King et al., "Making the Most of Statistical Analysis: Improving and Interpretation and Presentation" *American Journal of Political Science* 44, 2 (April 2000): 341-355.

Exercise:
#9, due April 1st

13. April 4th: Nonstationarity

Reading:
Gujarati, ch. 21

Exercise:
#10, due April 8th

14. April 11th: Time Series Cross Sectional Data

Readings:
Gujarati, ch. 16
Nathaniel Beck, "What to do (and not to do) with time-series cross-section data," *American Political Science Review* 89, 3 (September 1995): 634-647.

Exercise:
None; work on statistics project

15. April 18th: Event History Models

Reading:
J. Box-Steffensmeier and B. S. Jones, "Time Is of the Essence: Event-History Models in Political Science," *American Journal of Political Science* 41, 4 (October 1997): 1414-1461.

Exercise:
None; work on statistics project

16. April 25th: Review for Final

Reading:
None

April 25th: Statistics Project Due

May 2nd: Final Exam (7:00 to 10:00 p.m.)