IS 620: Advanced Statistical Techniques
for International Studies
Spring 2005

Wednesdays, 4:20—7:00 p.m.
Batten Arts & Letters 310

Assistant Professor David C. Earnest
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Spring 2005 Office Hours:
T 11:00 a.m.—12:00 noon
Th: 3:00—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, however, 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

Students are expected to 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 set theory; 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 (http://blackboard.odu.edu). An email account with an off-campus service provider (such as Yahoo! Mail) will not provide you the access to materials you need.
Course Materials

You can purchase the Gujarati book at the ODU bookstore in the Webb Center (http://odu.bookstore.com). 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


Recommended Software

SPSS Graduate Pack v. 12.0, available at the Monarch Techstore in the Webb Center. It is also installed on the computers in the graduate computer lab (BAL 720) and elsewhere on campus.

You may also wish to use R v.2.0.1, an open-source and free software package (“development environment”) for statistical computing and graphics. I have not used R and cannot attest to its ease of use, but 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.

Recommended Book


Course Requirements and Evaluation

Student grades are based upon four elements.

1. Exercises (30 percent of your grade): The student will complete twelve exercises in which you will apply the concepts and methods we study. Starting in week three, 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 10:00 p.m. the Tuesday night before the next class. For example, the assignment for week three is due the following Tuesday, February 1st.

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 relations 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, and
the Journal of Peace Research). Your critique should be a maximum of 1000 words. The original article should be appended 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.

Your written literature critique should address the following questions: (a) What is the substantive argument of the article? (b) What hypotheses are generated from the substantive argument? (c) What operationalizations are used 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 16th, 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 20th: 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. Overall conclusions

4. Final Examination (30 percent): We will have an in-class final exam during the University-designated exam period: May 4, 2005, from 3:45 to 6:45 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 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 an 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:

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<thead>
<tr>
<th>Percent</th>
<th>Final Grade</th>
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<tbody>
<tr>
<td>94–100</td>
<td>A</td>
</tr>
<tr>
<td>90–93</td>
<td>A–</td>
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<tr>
<td>87–89</td>
<td>B+</td>
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<tr>
<td>83–86</td>
<td>B</td>
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<tr>
<td>80–82</td>
<td>B–</td>
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<tr>
<td>0–79</td>
<td>C</td>
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**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 reserve, nevertheless, the final discretion to grant or withhold no-penalty extensions, and will do so only for serious reasons.

**Academic Integrity**

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.”

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. If you are unfamiliar with the honor code and disciplinary procedures, I suggest you visit the Honor Council’s webpage (http://studentservices.odu.edu/hc/). You may also refer to the Code of Student Conduct, Sanctions, and Disciplinary Procedures in the Old Dominion University Catalog 2004-2006, pp. 14-19.

If you are unsure what may or may not constitute plagiarism, I suggest you visit http://www.csun.edu/ssric/Modules/Other/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://web.odu.edu/webroot/orgs/AO/PO/eeo.nsf/pages/eeohome.

Course Plan and Schedule

1. January 12th: The logic of statistics, mathematical background, and an introduction to SPSS

2. January 19th: Review of Basic Statistics

   Readings:
   Gujarati, Appendix A

3. January 26th: Review of Bivariate Linear Regression

   Readings:
   Gujarati, chs. 1-2

   Exercise:
   #1, due February 1st
4. February 2nd: Bivariate Regression Continued

Readings: Gujarati, chs. 3-5, 6.2

Exercise: #2, due February 8th

5. February 9th: Categorical Independent Variables

Readings: Gujarati, ch. 15

Exercise: #3, due February 15th

6. February 16th: Crosstabulation and ANOVA Analysis

Readings: To be distributed on Blackboard

Exercise: #4, due February 22nd

7. February 23rd: Multiple Regression part I

Readings: Gujarati, ch. 7

Exercise: #5, due March 1st

8. March 2nd: Multiple Regression part II

Readings: Gujarati, ch. 8

Exercise: #6, due March 15th

9. March 9th: Spring Break, No Class

10. March 16th: Data Evaluation

Readings: To be distributed on Blackboard

Exercise: #7, due March 22nd

11. March 23rd: Relaxing Classical Assumptions, part I: Multicollinearity

Readings: Gujarati, ch. 4, ch. 10

Exercise: #8, due March 29th

12. March 30th: Relaxing Classical Assumptions, part II: Heteroscedasticity and Autocorrelation

Readings: Gujarati, chs. 11-12

Exercise: #9, due April 5th

13. April 6th: Categorical Dependent Variables
14. April 13th: Path Analysis

Readings: Gujarati, ch. 16
Exercise: #10, due April 12th

15. April 20th: Time Series Analysis

Readings: To be distributed on Blackboard
Exercise: #11, due April 19th

Exercise: #12, due April 26th

April 20th: Statistics Project Due

16. May 4th: Final Exam (3:45 to 6:45 p.m.)