

**PSC 702**  
**Advanced Research Design and Methodology**  
**Spring 2008**

Instructor: Dr. David Damore  
Time: W 5:30 – 8:20  
Location: CBC C309

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**Scope and Purpose:**

Building on the material taught in PSC 701, this course seeks to develop the skills necessary to evaluate and conduct systematic research in the social sciences using quantitative methods. The course is divided into three parts. Part one (roman numerals one through three below) examines the role of quantitative methods in the research process and introduces basic statistical techniques and concepts (e.g., descriptive statistics, statistical significance, and bivariate regression). Part two covers (roman numerals four and five below) the course's main emphasis: an in depth treatment of multivariate regression analysis, with particular attention given to the causes, consequences, and remedies for assumption violations. Part three (roman numerals through six and seven below) introduces students to more advanced statistical techniques including robust regression, time-series analysis, and maximum likelihood estimation. Upon completion, students should be able to read, understand, and evaluate original scholarly research employing these techniques, as well as develop, estimate, and interpret their own statistical models. The course is taught at a level that assumes minimal prior knowledge of statistics and basic math skills. With this said, success in this course necessitate that students work with the material on a near daily basis. Also, because course material builds incrementally, thorough knowledge of introductory material is essential for comprehension of later material.

**Course Material:**

*Required*

Berry, William D., and Stanley Feldman. 1985. *Multiple Regression in Practice*. Newbury Park: Sage Publications.

Levin, Jack, and James Alan Fox. 2004. *Elementary Statistics in Social Research, The Essentials 2<sup>nd</sup> edition*. Boston: Pearson Education.

Lewis-Beck, Michael S. 1980. *Applied Regression: An Introduction*. Newbury Park: Sage Publications.

*Recommended*

Gujarati, Damodar. 2006. *Essentials of Econometrics*, 3<sup>rd</sup> edition. Boston: Irwin McGraw-Hill.

## *Other Material*

Calculator

Course Reader and Lecture Notes (accessible via WebCampus)

Access to SPSS (most computer labs have SPSS; alternatively students may purchase SPSS).

Introductions and overviews to using SPSS can be found at these web sites:

[http://wadsworth.com/sociology\\_d/templates/student\\_resources/0534630367\\_babie/primers/SPSS\\_11.0\\_complete/index.html#toc](http://wadsworth.com/sociology_d/templates/student_resources/0534630367_babie/primers/SPSS_11.0_complete/index.html#toc)

<http://www.unt.edu/rss/class/spssintro/index115.htm>

<http://calcnet.mth.cmich.edu/org/spss/toc.htm>

## **Requirements:**

1. Homework (15%): A series of assignments made throughout the semester related to topics covered in lecture. The assignments include a combination of problem solving (both by hand and with SPSS), application, and interpretation. All homework may be resubmitted within one week for up to half of deducted amount.
2. Course Project (30%): Over the course of the term students will be develop an original research project of their own choosing that applies the statistical methods taught in the course to a relevant dataset. Specifically, students' projects should more-or-less resemble a quantitative journal article and consist of a research question, literature review, development of hypotheses derived from a theoretical argument and a research design sufficient to empirically validate these hypotheses, appropriate statistical analysis and interpretation of relevant data, and a conclusion. Students are welcome to use other projects they may be working on (such as a conference paper, dissertation, or thesis) as the basis for their course projects. More information will be forthcoming.
3. Exams (45%): Two take home exams; the first of which is worth 15% and will occur after coverage of bivariate regression. The second exam is worth 30% and will occur during finals week.
4. Classroom Contribution (10%): Determined by students' attendance, preparation, and willingness to enter into discussions as they arise. More to the point, class time provides you with the opportunity to ask questions and receive clarification, as well as provides me with the opportunity to qualitatively assess your level of understanding and engagement with course material.

**Policies and Miscellaneous:**

1. The honor code is strictly enforced. Any evidence of collaboration, plagiarism, or other violations of the honor code will be immediately referred to the proper authority. The only exception to this is that students may help one another in completing the homework assignments (although all students must turn in their own assignment).
2. Make-ups are granted for documented illnesses or deaths in the immediate family. **Late work is not accepted.** If you need to miss class because of observance of a religious holiday or because you represent UNLV at any official extracurricular activity you must notify me ASAP.
3. If you choose to attend lecture, plan to do so for its duration. Do not disrupt class by showing-up late, leaving early, or talking throughout. Repeated violations, including ringing cell phone and pagers and text messaging, will adversely affect your final grade. **Given the nature of course material, students who do not attend class will do poorly.**
4. While the amount of reading for this class is less than what is typically assigned in graduate courses, it is far more technical and dense than you may be accustomed to. As a consequence, it may take multiple readings to comprehend concepts presented in the readings. It is expected that reading assignments will be completed prior to the lectures for which they are assigned.
5. If you have a documented disability that may require assistance, you need to contact the Disability Resource Center (DRC) for coordination in your academic accommodations (the Disability Resource Center is located in Reynolds Student Services Complex, Room 317, 895-0866).
6. Cut-offs for final grades are as follows:

A = 100–94.0	B = 86.9–84.0	C = 76.9–74.0	D = 66.9-64.0
A- = 93.9–90.0	B- = 83.9–80.0	C- = 73.9–70.0	D- = 63.9-60.0
B+ = 89.9–87.0	C+ = 79.9–77.0	D+ = 69.9– 67.0	F = 59.9-0

**Course Organization and Reading Assignments**

My teaching strategy is to move through the material at a pace that insures that all students understand what is going on. Moreover, the difficulty of course material is variable, which should allow us to move quickly in some cases, while in other instances the pace may slow. As a consequence, I have organized the courses in terms of topics, as opposed to fixed dates.

**I. Introduction**

1. Course Overview
2. Introduction to SPSS

Levin and Fox: chapters 1 and 2  
Reader: “The Research Process”

*Suggested Reading*

Gujarati: chapter 1

## **II. Basic Statistical Concepts**

1. Descriptive statistics
2. Probability distributions, statistical significance, and hypothesis testing
3. Primer on basic inferential statistics

Levin and Fox: chapters 2 – 8; skim chapters 9 and 12  
Reader: “‘The Most Liberal Senator’? Analyzing and Interpreting Congressional Roll Calls”

*Suggested Reading*

Gujarati: chapters 2, 3, 4, 5  
Reader: “Political Innumeracy: Encounters with Coincidence, Improbability, and Chance”

## **III. Bivariate Regression**

1. Correlation and covariance
2. Assumptions and criteria for good estimators
4. Interpretation and inference

Levin and Fox: chapters 10 and 11  
Lewis-Beck: chapters 1 and 2

*Suggested Reading*

Gujarati: chapters 6 and 7

**\*\*\* Exam 1 \*\*\***

## **IV. Multiple Regression**

1. Introduction
2. Assumptions
3. Interpretation and inference

Berry and Feldman: chapter 1

Lewis-Beck: pages 47-57, 63-65, 71-74  
Reader: "Sophomore Surge in State Legislative Elections, 1968-86."

*Suggested Reading*

Gujarati: chapter 8  
Reader: "What Does 'Explained Variance' Explain?: Reply," "How Not to Lie with Statistics: Avoiding Common Mistakes in Quantitative Political Science," "Truth' Is Stranger than Prediction, More Questionable than Causal Inference," and "The R-Squared: Some Straight Talk"

**V. Violations of Regression Assumption: Causes, Consequences, and Remedies**

1. Specification and measurement error

Berry and Feldman: chapters 2 and 3  
Reader: "Representative Bureaucracy and Harder Questions: A Response to Meier, Wrinkle, and Polinard"

*Suggested Reading*

Gujarati: chapter 11  
Reader: "Let's Put Garbage-Can Regressions and Garbage-Can Probits Where They Belong," and "The Phantom Menace: Omitted Variable Bias in Econometric Research"

2. Multicollinearity, nonlinearity, and nonadditivity

Berry and Feldman: chapters 4 and 5  
Lewis-Beck: 58-62, 66-70  
Reader: "The Effect of the AFL-CIO's 'Voter Education' Campaigns on the 1996 House Elections" and "Stereotype Threat and Race of Interviewer Effects in a Survey on Political Knowledge"

*Suggested Reading*

Gujarati: chapters 9, 10, 12  
Reader: "In Defense of Multiplicative Terms in Multiple Regression Equations"

3. Outliers, leverage points, heteroskedasticity and autocorrelation

Berry and Feldman: chapters 6 and 7  
Reader: "A Dynamic Model of Candidate Fundraising: The Case of Presidential Nomination Campaigns," "Outlying and Influential Data," and "Political Institutions and Voter Turnout in the Industrial Democracies"

*Suggested Reading*

Gujarati: chapters 13, 14

Reader: “Regression Diagnostics: An Expository Treatment of Outliers and Influential Cases”

**VII. Extensions of the Basic Regression Model**

1. Pooled models

Reader: “Explaining Japanese Aid Policy in Latin American: A Test of Competing Theories”

2. Causal modeling

Reader: "The Multi-Layered Impact of Public Opinion on Capital Punishment Implementation in the American States"

3. Robust regression

Reader: “Concepts and Suggestions for Robust Regression Analysis”

4. Time series analysis

Reader: “Can Government Regulate Safety? The Coal Mining Example” and “Time Series Analysis Regression Techniques, 2<sup>nd</sup> ed.”

*Suggested Reading*

Gujarati: chapter 16.1 – 16.5

Reader: “What to Do (and What Not to Do) With Time-Series Cross-Section Data” and “Regression in Time and Space: A Statistical Essay”

**VIII. Beyond OLS: Maximum Likelihood Estimation (MLE)**

1. The theory and mechanics of MLE

2. Analyzing dichotomous dependent variables: logit and probit

Reader: “Probing the Bounds of Conventional Wisdom: A Comparison of Regression, Probit, and Discriminant Analysis” and “The Dynamics of Issue Ownership in Presidential Campaigns”

*Suggested Reading*

Gujarati: 16.6

## Course Readings

### Applications

- Clinton, Joshua D., Simon Jackman, and Doug Rivers. 2004. "The Most Liberal Senator"? Analyzing and Interpreting Congressional Roll Calls." *PS: Political Science and Politics* 37:805-811.
- Damore, David F. 2004. "The Dynamics of Issue Ownership in Presidential Campaigns." *Political Research Quarterly* 57:391-397.
- Damore, David F. 1997. "A Dynamic Model of Candidate Fundraising: The Case of Presidential Nomination Campaigns." *Political Research Quarterly* 50:343-364.
- Davis, Darren W., and Brian D. Silver. 2003. "Stereotype Threat and Race of Interviewer Effects in a Survey of Political Knowledge." *American Journal of Political Science* 47:33-45.
- Holbrook, Thomas M., and Charles M. Tidmarch. 1991. "Sophomore Surge in State Legislative Elections, 1968-86." *Legislative Studies Quarterly* 16:49-63.
- Jackman, Robert W. 1987. "Political Institutions and Voter Turnout in the Industrial Democracies." *American Political Science Review* 81:405-423.
- Jacobson, Gary C. 1999. "The Effect of the AFL-CIO's 'Voter Education' Campaigns on the 1996 House Elections." *The Journal of Politics* 61:185-94.
- Lewis-Beck, Michael S., and John R. Alford. 1980. "Can Government Regulate Safety? The Coal Mining Example." *American Political Science Review* 74:745-756.
- Nielson, Laura B., and Patrick J. Wolf. 2001. "Representative Bureaucracy and Harder Questions: A Response to Meier, Wrinkle, and Polinard." *The Journal of Politics* 63:598-615.
- Norrander, Barbara. 2000. "The Multi-Layered Impact of Public Opinion on Capital Punishment Implementation in the American States." *Political Research Quarterly*. 53:771-793.
- Tuman, John P., and Craig F. Emmert. 2001. "Explaining Japanese Aid Policy in Latin America: A Test of Competing Theories." *Political Research Quarterly* 54:87-101.

### **Statistics (Required)**

- Aldrich, John, and Charles F. Cnudde. 1975. "Probing the Bounds of Conventional Wisdom: A Comparison of Regression, Probit, and Discriminant Analysis." *American Journal of Political Science* 19:571-608.
- Asher, Herbert B. 1984. "The Research Process." In *Theory-Building and Data Analysis in the Social Sciences*, eds Herbert B. Asher, Herbert F. Weisberg, John H. Kessel, and W. Phillips Shively. Knoxville: University of Tennessee Press.
- Fox, John. 1991. "Outlying and Influential Data." In *Regression Diagnostics*. Newbury Park: Sage Publications.
- Ostrom, Charles W. Jr. 1990. *Time Series Analysis Regression Techniques*, 2<sup>nd</sup> ed. Newbury Park: Sage Publications. Chapters 1, 2, and 4.
- Western, Bruce. 1995. "Concepts and Suggestions for Robust Regression Analysis." *American Journal of Political Science* 29:786-817

### **Statistics (Suggested)**

- Achen, Christopher H. 2005. "Let's Put Garbage-Can Regressions and Garbage-Can Probits Where They Belong." *Conflict Management and Peace Science* 22:327-39.
- Achen, Christopher H. 1990. "What Does 'Explained Variance' Explain?: Reply." In *Political Analysis*, Volume 2. Ann Arbor: The University of Michigan Press.
- Beck, Nathaniel, and Jonathan N. Katz. 1995. "What to Do (and What Not to Do) With Time-Series Cross-Section Data." *American Political Science Review* 89:634-647.
- Bollen, Kenneth A., and Robert W. Jackman. 1990. "Regression Diagnostics: An Expository Treatment of Outliers and Influential Cases." In *Modern Methods of Data Analysis* eds, John Fox and J. Scott Long. Newbury Park: Sage Publications.
- Clarke, Kevin A. 2005. "The Phantom Menace: Omitted Variable Bias in Econometric Research." *Conflict Management and Peace Science* 22:341-52.
- Friedrich, Robert J. 1982. "In Defense of Multiplicative Terms In Multiple Regression Equations." *American Journal of Political Science* 26:797-833.
- King, Gary. 1991. "'Truth' Is Stranger than Prediction, More Questionable than Causal Inference." *American Journal of Political Science* 35:1047-53.

- King, Gary. 1986. "How Not to Lie with Statistics: Avoiding Common Mistakes in Quantitative Political Science." *American Journal of Political Science* 30:666-87.
- Lewis-Beck Michael S., and Andrew Skalaban. 1990. "The R-Squared: Some Straight Talk." In *Political Analysis*, Volume 2. Ann Arbor: The University of Michigan Press.
- Mock, Carol, and Herbert F. Weisberg. 1992. "Political Innumeracy: Encounters with Coincidence, Improbability, and Chance." *American Journal of Political Science* 36:1023-46.
- Stimson, James A. 1985. "Regression in Time and Space: A Statistical Essay." *American Journal of Political Science* 29:914-47.