

PSC 531: INTERMEDIATE STATISTICS FOR SOCIAL SCIENCE

Spring 2017
Wednesdays 4:30PM-7:20PM
Park 502

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Office Hours: Tuesday, 2-5pm; or by appointment

DESCRIPTION: This is the second course in the graduate methods sequence required for Political Science Ph.D. students. It is also intended for M.A. students who wish to further their training in quantitative analysis. By this point you have enjoyed an introduction to probability, the logic of hypothesis testing, statistical inference, and the two-variable regression model. This course builds on this knowledge by further exploring regression analysis. It also provides a basic knowledge for more advanced statistical methods. Much of the course focuses on the assumptions of the linear regression model, techniques for addressing various violations of those assumptions, and topics related to model specification and functional form. We also briefly discuss maximum likelihood estimation, including an overview of models for binary dependent variables and ordinal variables.

Some of your assignments, discussed below, will require a computer as well as a statistical software. We may on occasion meet in the computer lab located on the 4th floor of Park Hall. For your computer-based work, I recommend using Stata. Student licenses are available at www.stata.com, but the software is also on computers in the lab.

REQUIRED BOOK:

Gujarati, Damodar N., and Dawn C. Porter. 2009. *Basic Econometrics*, 5th ed. New York: McGraw Hill/Irwin

IMPORTANT DATES:

- **March 29:** Midterm exam
- **April 5:** No class
- **April 19:** Replication analysis due
- **May 10:** Research paper due
- **TBD:** Final exam

READINGS:

You must do all the assigned readings prior to class. Most readings are drawn from Gujarati and Porter; other assigned readings can be found on UBlerns. Please bring the readings to class in order to discuss them if needed.

COURSE GRADE:

Homework assignments	20%
Midterm exam	20%
Final exam	25%
Replication analysis	10%
Final paper	25%

HOMEWORK ASSIGNMENTS:

You will have several homework assignments over the course of the semester. You must turn these in at the beginning of class the day they are due. You may work collaboratively on the assignments. However, you must turn in your own assignment; copying answers from someone else is not acceptable and will be treated as academic misconduct.

EXAMS

There will be a midterm exam (March 29) and a final exam (date TBD). The final exam will be cumulative, but will be weighted heavily toward the second half of the course.

REPLICATION ANALYSIS:

You will conduct a replication of a published article that uses quantitative methods (due at the beginning of class on April 19). **You must meet with me by February 22 to discuss the paper you have chosen to replicate.**

RESEARCH PAPER:

You will write an original research paper drawing on techniques learned in this class (due at the beginning of class on May 10). **You must meet with me by March 15 to discuss the topic of your paper.** The research paper should be closely modeled on a scholarly journal article: articulate a research question, review the relevant literature, identify a set of theoretical propositions and elaborate specific hypotheses, propose and justify a set of measures, and use appropriate data and techniques to test these hypotheses. **You may be called upon periodically to update the class on your progress with the paper.**

ACADEMIC INTEGRITY: I expect students to refrain from cheating, plagiarizing, or engaging in any other type of academic misconduct (including copying homework assignments). To find out more on academic regulations, please consult <http://catalog.buffalo.edu/policies/course/integrity.html>

Without exception, cases of academic misconduct will be dealt with according to University policy.

COURSE OUTLINE:

Please note that this is a **preliminary** outline. We may progress at a different pace as the one outlined below and I may periodically update the syllabus. Moreover, there may be additional/different readings for which you will receive sufficient notice.

Feb. 1 Introduction, course organization

Feb. 8 Two-variable regression

Readings:

Gujarati and Porter, Chapters 2, 3, 4, 5

Achen, *Interpreting and Using Regression*, pp. 37-51 (available on UBlerns)

McCaskey and Rainey. "Substantive Significance and the Veil of Statistical Significance."
(available on UBlerns)

Rainey. "Arguing for a Negligible Effect." (available on UBlerns)

- Feb. 15 Multiple regression
Readings:
Gujarati and Porter, Chapters 7, 8, and pp. 277-284
Achen, *Interpreting and Using Regression*, pp. 51-68 (available on UBlerns)
Achen, Christopher H. 1990. "What Does "Explained Variance" Explain?: A Reply."
Political Analysis 2: 173-84 (available on UBlerns)
- Feb. 22 Multiple regression (cont'd)
Readings:
Gujarati and Porter, Chapters 7, 8, and pp. 277-284
Achen, *Interpreting and Using Regression*, pp. 51-68 (available on UBlerns)
Achen, Christopher H. 1990. "What Does "Explained Variance" Explain?: A Reply."
Political Analysis 2: 173-84 (available on UBlerns)
- Mar. 1 Interaction terms
Readings:
Gujarati and Porter, pp. 285-290
Wooldridge, pp. 173-179 and 217-224 (available on UBlerns)
Braumoeller, Bear. 2004. "Hypothesis Testing and Multiplicative Interaction Terms."
International Organization 58: 807-20 (Available on UBlerns)
Brambor, Thomas, William Roberts Clark, and Matt Golder. 2006. "Understanding
Interaction Models: Improving Empirical Analyses." *Political Analysis* 14: 63-82
(available on UBlerns)
Berry et al. "Improving Tests of Theories Positing Interaction." (available on UBlerns)
- Mar. 8 MLE: Logit and probit
Readings:
Gujarati and Porter, Ch. 15
Wooldridge, pp. 224-229, 524-536 (available on UBlerns)
Long, J. Scott. 1997. Excerpts (available on UBlerns)
- Mar. 15 MLE: Logit and probit (cont'd)
Readings:
Berry et al. 2010. "Testing for Interaction in Binary Logit and Probit Models: Is a
Product Term Essential?" *American Journal of Political Science* (available on UBlerns)
Rainey, Carlisle. "Compression and Conditional Effects" (available on UBlerns)
- Mar. 22 **SPRING BREAK**
- Mar. 29 **MIDTERM EXAM**
- Apr. 5 **NO CLASS**
- Apr. 12 MLE: ordinal, multinomial, count models
Readings:
Long, J. Scott. 1997. Excerpts (available on UBlerns)

- Apr. 19 **REPLICATION ANALYSIS DUE**
Multicollinearity, heteroscedasticity
Readings:
Gujarati, Chap. 10 and 11
Arceneaux, Kevin, and John Huber. 2007. "What to Do (and Not Do) with
Multicollinearity in State Politics Research." *State Politics and Policy Quarterly* 7: 81-101
(available on UBlerns)
Downs, George W., and David M. Roche. 1979. "Interpreting Heteroscedasticity."
American Journal of Political Science 23: 816-28 (available on UBlerns)
- Apr. 26 Autocorrelation
Readings:
Gujarati, Chap. 12
- May 3 Model specification
Readings:
Gujarati, Chap. 13
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 (available
on UBlerns)
Clarke, Kevin A. 2005. "The Phantom Menace: Omitted Variable Bias in Econometric
Research." *Conflict Management and Peace Science* 22: 341-52 (available on UBlerns)
Oneal, John R., and Bruce Russett. 2005. "Rule of Three. Let It Be? When More Really
Is Better." *Conflict Management and Peace Science* 22: 293-310 (available on UBlerns)
- May 10 **RESEARCH PAPER DUE**
Additional topics (e.g., selection models, panel data, 2SLS)
Readings:
TBD
- TBD **FINAL EXAM**