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**PSC 405**

**Linear Models**

Spring 2018  
3:25-4:40 T/TH  
Harkness 329

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### **PREREQUISITES**

The prerequisites for this course include a mathematical statistics course at the level of PSC 404 and mathematical modeling at the level of PSC 407.

### **COURSE REQUIREMENTS**

The requirements consist of problem sets, a midterm, and a final. The problem sets will be divided between analytic and empirical exercises, and all empirical exercises will be performed in R. Students are also responsible for the additional readings. The course grade will be calculated as follows: problem sets 20%, midterm 40%, final 40%.

### **COURSE WEBPAGE**

<https://www.kevinclarke.org/psc-405.html>

### **TEXTS**

The required texts for this course are:

- Hansen, Bruce E. 2014. *Econometrics*.  
<http://www.ssc.wisc.edu/~bhansen/econometrics/>
- Faraway, Julian. 2002. *Practical Regression and Anova using R*.  
<http://cran.r-project.org/doc/contrib/Faraway-PRA.pdf>  
The accompanying source code and data, are free on the web here:  
<http://cran.r-project.org/web/packages/faraway/index.html>
- Achen, Christopher. 1982. *Interpreting and Using Regression*. Sage.

For when you need a simpler initial overview, the following lower-level texts may be helpful:

- Gujarati, Damodar N. 2003. *Basic Econometrics*. 4th edition. McGraw-Hill.
- Hamilton, Lawrence. 1999. *Regression with Graphics*.
- Hanushek and Jackson. 1976. *Statistical Methods for Social Scientists*.
- Kennedy, Peter. 2001. *A Guide to Econometrics*. 4th ed.
- Kmenta, Jan. 1986. *Elements of Econometrics*. 2nd ed.
- Lardaro, Leonard. 1993. *Applied Econometrics*.
- Weisberg, Sanford. 1985. *Applied Linear Regression*. 2nd ed.
- Wooldridge, Jeffrey. 2003. *Introductory Econometrics: A Modern Approach*.

## **COURSE SCHEDULE**

**Topic 1: Linear Model Basics**

**Topic 2: Specification and misspecification**

**Topic 3: Instrumental variables**

**Topic 4: Nonlinear estimators**

**Topic 5: Generalized method of moments**

**Topic 6: Bayesian methods**

**Topic 7: Panel models**

**Topic 8: Semiparametric methods**

## **Additional reading**

- Achen, C. 1977. "Measuring Representation: Perils of the Correlation Coefficient." *American Journal of Political Science* 21:805-815.
- Freedman, D. 1991. "Statistical Models and Shoe Leather." *Sociological Methodology* 21:291-313.
- Rosenbaum, P. 1999. "Choice as Alternative to Control in Observational Studies." *Statistical Science* 14:259-304.

- Achen, C. 1990. "What Does 'Explained Variance' Explain?: Reply." *Political Analysis* 2:173-184.
- King, G. 1986. "How Not to Lie with Statistics," *American Journal of Political Science* 30:666-687.
- Belsley, Kuh, and Welsch. 1980. *Regression Diagnostics*, Ch. 2.
- Farrar & Glauber. 1967. "Multicollinearity in Regression Analysis: the Problem Revisited." *Review of Economics and Statistics* 49: 92-107.
- Lemieux, P. 1978. "A Note on the Detection of Multicollinearity." *American Journal of Political Science* 22: 183-186.
- Clarke, K. 2005. "The Phantom Menace: Omitted Variable Bias in Econometric Research." *Journal of Conflict Management and Peace Science* 22: 341-352.
- Friedrich, R. 1982. "In Defense of Multiplicative Terms in Multiple Regression Equations." *American Journal of Political Science* 26: 797-833.
- Braumoeller, B. 2005. "Hypothesis Testing and Multiplicative Interaction Terms." *International Organization* 58: 807-820. (And the "author's checklist": [www.people.fas.harvard.edu/~bfbraum/checklist.html](http://www.people.fas.harvard.edu/~bfbraum/checklist.html))
- Bartels, L. 1991. "Instrumental and 'Quasi-Instrumental' Variables." *American Journal of American Politics* 35: 777-800.
- Achen, C. 1985. "Proxy Variables and Incorrect Signs on Regression Coefficients." *Political Methodology* 11: 299-316.
- Mundlak, Y. 1978. "On the Pooling of Time Series and Cross Section Data." *Econometrica* 46: 69-85.
- Beck & Katz. 1995. "What to do (and not to do) with Time-Series Cross-Section Data." *American Political Science Review* 89: 634-647.