

220:403
Advanced Econometrics
Spring Semester, 2022

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Office Hours: To be announced and by appointment.

This course will consist of a midterm and a final exam as well as computer exercises. The computer exercises will make use of computer software of your choice. e.g., EViews, Excel, R, Python, SAS, Stata, etc. EViews will be used in class. EViews is a user-friendly program and is available in the Economics Computer Lab in Hill 806. (A student version of EViews can be obtained online and through the “Rutgers Virtual Computer Labs”, but, once again, it is available in Hill 806.)

Prerequisites: Successful completion of both Statistical Methods (220:203) and Introduction to Econometrics (220:303). Some rudimentary knowledge of calculus is expected.

Office Hours will be conducted via Webex. Every student should have a Rutgers version of Webex. You can check with the Office of Information Technology if you have problems acquiring this. You can connect to class office hours at: <https://rutgers.webex.com/meet/ploeb> The times for office hours will be announced in class.

More on Software: As mentioned above, students will need to make use of a software package to do regression analysis. There are many such programs and some students may be familiar with their use, e.g., Excel. Students can access a lot of software through the Rutgers Virtual Computer Labs using the following link: <https://it.rutgers.edu/virtual-computer-labs/>

Rutgers, as mentioned above, makes available many software packages through the virtual computer labs. To access the use of a free Rutgers version of EViews, for example, follow the directions below:

1. Go to the website: <https://it.rutgers.edu/virtual-computer-labs/knowledgebase/accessing-virtual-computer-labs/>
2. At the “Logging In” section, click on Navigate to <https://labgate.rutgers.edu>
3. Click on “OK”
4. On the left-hand side of the screen, double click on “Programs”
5. Double click on “Class Software”
6. Double click on “Eviews9”
7. Double click on “Eviews9(x64)”
8. Click on “Ok”

The reading of Journal Articles will be required and they will be discussed in class. A sample of articles to be discussed is included in this outline. Additional papers will be assigned as the class progresses.

The final exam date is **Tuesday, May 10, 2022 from 8:30-11:30 am**. The University determines the date and time for the final exam. (Any conflict must be addressed by the other instructor.)

The course will be composed of advanced topics beyond those covered in Econometrics: 220:303. Estimation techniques beyond Ordinary Least Squares will be developed along with estimation issues not addressed in Econometrics 303. Students will be prepared to read articles using classical econometric techniques and Bayesian methods (to some extent).

Text: Any reasonable text on econometrics may be used. Students who have need of an econometrics text may find the following useful: Robert S. Pindyck and Daniel L. Rubinfeld (1998), Econometric Models and Economic Forecasts, Irwin McGraw-Hill, Inc. 4th ed. (It is suggested that you rely initially on the text used in the course you took in Econometrics 303 or Introduction to Econometrics. You need **not** buy an additional textbook.)

Recommended: A Guide to Econometrics, Peter Kennedy, any edition.

Helpful Texts: Using Econometrics: A Practical Guide, A.H. Studenmund, any edition.
Essentials of Econometrics, D. Gujarati and D. Porter, (2010)
Introductory Econometrics – A Modern Approach, J Wooldridge

TOPICS (Suggested)

1. Review of the Classical Linear Regression Model (including the assumptions and the violation of the assumptions).
2. Some additional issues dealing with tests of the classical assumptions, e.g., H-test, issues with the DW test, White Test, White Corrections, etc. (Are t-tests and p-values all that count?)
3. Omission of a regressor(s), and simultaneous equation bias.
4. Simultaneous Equations and Estimation
 - a. Simultaneous equations
 - b. The Identification Problem in Econometrics and Endogeneity
 - c. Recursive equation systems and block recursive systems
 - d. Seemingly unrelated equations
 - e. Two Stage and Three Stage Estimation
5. Regression Specification Error Test (RESET)
6. Maximum Likelihood Estimation
7. Binary Choice Models
 - i. Probit Model
 - ii. Logit Model
8. Missing Observations
9. Bayesian Modeling
10. Panel Data - Pooling

- i. Fixed Effect Model
- ii. Random Effect Model

11. Topics in Applied Economics

Articles for Discussion

American Statistical Association, "American Statistical Association Releases Statement on Statistical Significance and P-Values: Provides Principles to Improve the Conduct and Interpretation of Quantitative Science," March 7, 2016. See:

<http://amstat.tandfonline.com/doi/abs/10.1080/00031d305.2016.1154108#.Vt2XIOaE2MN>

Wasserstein, R., "ASA Statement on Statistical Significance and P-Values," pp. 129-133. Paper may be found using Google.

Blattenberger, G., R. Fowles, P.D. Loeb, and W. Clarke (2012) "Understanding the Cell Phone Effect on Vehicle Fatalities: a Bayesian View," Applied Economics, 1823-1835. In iFirst: URL: <http://dx.doi.org/10.1080/00036846.2011.554379>

Fowles, R. and P. Loeb, (2016), "Sturdy Inference: A Bayesian Analysis of U.S. Motorcycle Helmet Laws," Journal of the Transportation Research Forum, 41-64.

Fowles, R., P. Loeb, and Wm. Clarke, (Nov. 2010), "The Cell Phone Effect on Motor Vehicle Fatality Rates: A Bayesian and Classical Econometric Evaluation," Transportation Research Part E: Logistics and Transportation Review, 1140-1147.

Hill, B. (1986), "Some Subjective Bayesian Consideration in the Selection of Models," Econometric Review 4 (2), 191-246.

Leamer, E. E. March 1983), "Let's Take the Con Out of Econometrics," *American Economic Review*.

Loeb, P., W. Clarke, and R. Anderson, (Oct.-Nov. 2009), "The Impact of Cell Phones on Motor Vehicle Fatalities," Applied Economics, (with Wm. Clarke and R. Anderson), 41, 2905-2914.

Ramsey, J. B. (1969). "Tests for Specification Errors in Classical Linear Least Squares Regression Analysis". Journal of the Royal Statistical Society, Series B. **31** (2): 350–371.