

**Econ 623 - Econometrics I  
(Section 0101)**

**Instructor:**

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**TA:**

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**Discussion Section:**

Thurs. 4:30 - 6:15 pm, Tydings Hall, Room 1108

**Lecture:**

Tues./Thurs. 12:30 - 1:45 pm, Tydings Hall, Room 2110

**Prerequisite:**

Students are presumed to have had at least a one-semester course in mathematical statistics at the level of R.V. Hogg, A. Craig, and J.W. McKean, *Introduction to Mathematical Statistics* (6<sup>th</sup> ed.). Linear algebra and elementary calculus will be used freely. Requisite linear algebra will be reviewed in section.

### **Academic Integrity:**

Academic integrity is a foundation for learning. The University has approved a Code of Academic Integrity available on the web at [www.president.umd.edu/policies/iii100a.html](http://www.president.umd.edu/policies/iii100a.html). The Code prohibits students from cheating on exams, plagiarizing, submitting the same paper for credit in two courses without authorization, buying papers, submitting fraudulent documents, and forging signatures.

### **Students with Disability:**

A student, who has a documented disability and who wishes to receive accommodation or services from the University's Disabilities Support Service (DSS), must first complete a registration process which involves meeting with one of the senior staff members at DSS and providing the appropriate documentation. An appointment with DSS can be scheduled by calling (301) 314-7682.

### **Principle Textbook:**

- (G) W. H. Greene, *Econometric Analysis*, 7th Edition. Prentice Hall, 2011.  
(ISBN-10: 0131395386)

### **Recommended Supplementary Textbook:**

- (W) J. Wooldridge, *Econometric Analysis of Cross Section and Panel Data*, 2nd Edition. MIT Press, 2010. (ISBN-10: 0262232588)

### **Other Econometric Texts:**

The following is a non-exhaustive list of other econometrics textbooks.

T. Amemiya, *Advanced Econometrics*. Harvard University Press, 1985.

E.R. Berndt, *The Practice of Econometrics: Classic and Contemporary*. Addison-Wesley, 1991. (B)

R. J. Bowden and D. Turkington, *Instrumental Variables*. Cambridge University Press, 1984.

G. C. Chow, *Econometrics*. McGraw Hill, 1983.

- A.C. Cameron and P.K. Trivedi, *Microeconometrics: Methods and Applications*. Cambridge University Press, 2005. (CT)
- R. Davidson and J. MacKinnon, *Estimation and Inference in Econometrics*. Oxford University Press, 1993. (DM)
- A. S. Goldberger, *A Course in Econometrics*. Harvard University Press, 1991.
- E. Greenberg and C. E. Webster, *Advanced Econometrics: A Bridge to the Literature*. Wiley, 1983.
- Hayashi, F. (2000). *Econometrics*. Princeton: Princeton University Press.
- D. F. Hendry and K. F. Wallis, *Econometrics and Quantitative Economics*. Blackwell, 1986.
- J. Johnston and J. DiNardo, *Econometric Methods*, 4th Edition. McGraw Hill, 1997. (JD)
- G. G. Judge, et al., *The Theory and Practice of Econometrics*, 2nd Edition. Wiley, 1985. (JGHLL)
- J. Kmenta, *Elements of Econometrics*, 2nd Edition. MacMillan, 1986.
- G. Maddala, *Econometrics*. McGraw Hill, 1977.
- E. Malinvaud, *Statistical Methods of Econometrics*, 3rd Edition. North-Holland, 1980.
- P. A. Ruud, *An Introduction to Classical Econometric Theory*, Oxford University Press, 2001. (PR)
- J. D. Sargan, *Lectures on Advanced Econometric Theory*. Basil Blackwell, 1988.
- A. Spanos, *Statistical Foundation of Econometric Modeling*. Cambridge University Press, 1986.
- P. Schmidt, *Econometrics*. Marcel Dekker, 1976. (S)
- H. White, *Asymptotic Theory for Econometrician*, Revised Edition. Academic Press, 2000. (W)
- H. Theil, *Principles of Econometrics*. Wiley, 1971.
- A. Zellner, *An Introduction to Bayesian Inference in Econometrics*. Wiley-Interscience, 1996. (Z)

### **Statistics Texts:**

These are especially useful for students who desire a more complete treatment of a topic in statistical theory or who plan further work in econometrics.

D. Cox and D. Hinkley, *Theoretical Statistics*. Chapman and Hall, 1974.

E. L. Lehmann and G. Casella, *Theory of Point Estimation*, 2nd Edition Springer, 1998.

E. L. Lehmann and J.P. Romano, *Testing Statistical Hypotheses*, 3rd Edition. Springer, 2005.

C. R. Rao, *Linear Statistical Inference and Its Application*. Wiley, 1973.

R. J. Serfling, *Approximation Theorems of Mathematical Statistics*. Wiley, 1980.

S. D. Silvey, *Statistical Inference*. Chapman and Hall, 1975.

### **Handbooks:**

Z. Griliches and M. Intriligator, eds., *Handbook of Econometrics*, Vol. 1. North-Holland, 1983.

Z. Griliches and M. Intriligator, eds., *Handbook of Econometrics*, Vol. 2. North-Holland, 1984.

Z. Griliches and M. Intriligator, eds., *Handbook of Econometrics*, Vol. 3. North-Holland, 1986.

R. Engle and D. McFadden, eds., *Handbook of Econometrics*, Vol 4. Elsevier, 1994.

J. Heckman and E. Leamer, eds., *Handbook of Econometrics*, Vol 5, Elsevier, 2001.

### **Exercise Collections:**

P. C. B. Phillips and M. R. Wickens, *Exercises in Econometrics*, Vol. I & II. Allen/Ballinger, 1978.

K. Abadir and J. Magnus, *Econometric Exercises Vol 1: Matrix Algebra*. Cambridge University Press, 2005.

**Course Outline and Reading List**  
(R - required reading; S - suggested reading)

0. Linear Algebra Review (covered in Section)

- (R) G: Appendix A
- (S) JD: Appendix A

1. Linear Regression - Basic Results

- Model Specification and Assumptions
- Properties of Ordinary Least Squares (OLS) Estimators
- Gauss-Markov Theorem
- Partitioned Regression
- Goodness of Fit and ANOVA
- Normal Model and Maximum Likelihood
- Stochastic Regressors

- (R) G: Chapters 2-4
- (S) PR: Chapter 1, Sec. 2.1-2.4, 2.6, Chapter 3, and Chapters 6-10

2. Linear Regression - Hypothesis Testing

- Tests of Linear Restrictions and Restricted Least Squares
- Tests of Structural Change

- (R) G: Chapter 5-6
- (S) PR: Chapter 4 and Chapter 11

3. Asymptotics for the Linear Regression Model

- Review of Some Preliminary Asymptotic Results
- Asymptotic Theory for the Linear Regression Model
- Tests of Nonlinear Restrictions
- Asymptotic Efficiency and Maximum Likelihood Estimation

- (R) G: Appendix D; Chapter 4, Sec. 4.4; Chapter 5, Sec 5.3-5.4  
W: Chapters 3, 4.2.1-4.2.2
- (S) Serfling: Chapter 1

#### 4. Generalized Linear Regression Model

- Generalized Least Squares
- Heteroskedasticity
- Serial Correlation
- Robust Covariance Matrix Estimation
- Seemingly Unrelated Regressions

(R) G: Chapters 9-10, W: Chapters 4.2.3 and 7  
(S) PR: Chapters 18-19

#### 5. Non-orthogonality of Regressors and Errors

- Errors-in-Variables
- Simultaneous Equations Models
- Instrumental Variables Estimation
- Hausman-Wu Specification Tests

(R) G: Chapter 8, W: Chapters 5, 8, and 9  
(S) PR: Chapters 20 and 26

#### 6. Bayesian Methods

- Bayesian Approach to Estimation and Inference
- Applications to Econometric Models

(R) G: Chapter 8  
Z: Chapters 1-3  
(S) CT: Chapter 13

## 7. Bootstrap

- Parametric Bootstrap
- Nonparametric Bootstrap
- Bootstrap Estimation of Bias and Variance
- Consistency and Asymptotic Refinement
- Bootstrap Methods for Regression Models

- (R) G: Chapter 15; W: Chapter 12.8  
Hall, P. "Methodology and Theory for the Bootstrap," In **Handbook of Econometrics**. Vol. IV. Edited by Robert F. Engle and Edward E. Leamer. Amsterdam, The Netherlands: North-Holland Publishing Co., 1994, chapter 39, pp. 2342-2383.
- (S) CT: Chapter 11

## **Grading Policy and Expectation of Students:**

1. Course grade will be based on homework assignments, a midterm and a final; and they are weighted as follows:

Homework	20%
Midterm Exam	30%
Final Exam	50%

Homework problems will consist of theoretical problems and/or empirical (computer) exercises. Homework problems are handed out on Tuesdays and are due two Mondays after they are handed out. No credit will be given for homework that is late. (Problem sets should be handed in to the TA in person if at all possible. Problem sets that are slipped under the door or placed in mail boxes are not considered handed in until they are found!) The computer may be down for certain periods. Therefore, it is essential that computer assignments are started early. No extension of the deadlines for the assignments will be granted, unless the computer was down for at least 100 hours in the two-week assignment period.

- Under University rules, absence from an examination (either the midterm or the final) is allowed only in cases of illness (supported by doctor's note), religious observance, participation in University activities at the request of the University authorities, or compelling circumstances beyond the student's control. Hence, only in these situations would a make-up exam be given. If possible, the student should inform me (or the Economics Department) of his or her situation before the exam.

Final Exam will be cumulative.

2. Please do not disrupt class for your fellow students by talking in class, using a cell phone, or typing text messages. In addition, I would appreciate it greatly if you would not refrain from using your laptop while I am lecturing. If you happen to arrive late to class, please seat yourself quietly in the back and avoid walking to the front of the classroom.

## **Exam Dates:**

The midterm exam is scheduled for Thursday, October 29, during class; whereas the final exam has been scheduled by the University for Friday, Dec 18, from 1:30pm-3:30pm.