

TUFTS UNIVERSITY
Department of Economics

Economics 201
Advanced Statistics
Autumn 2005

Prof. M. Bianconi
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OH: Tu, Th, 3:00-4:00p.m.
or by appointment.

ADVANCED STATISTICS

The Web Page for this course is: www.tufts.edu/~mbiancon/ec201-05.html

Prerequisite: Undergraduate Statistics and Multivariate Calculus or equivalent, or consent

Course Requirements:

- Two Mid-Term-Hour(+) Exams (20% each) - Tu, Oct 18; Tu, Nov 22 - You are allowed to bring a single, one-sided 8 ½ x 11 inch equation sheet to the midterm, you may put any information on the equation sheets that you think may be useful to you.
- One Two-Hour Final Exam (35%) – W, Dec 14, 3:30-5:30PM – Format to be determined
- Five Practice Problem Sets (4% each)
- Class Participation and Attendance (5%)

{Exam and Problem Sets Policy: There are no make-up exams. Problem set is due one week(seven days) after it has been handed out; after the deadline, the problem set loses 20% of its value for each late day; problem sets handed in six or more days after the deadline have no value; all grades in this class are curved.}

Texts and Software:

Wackerly, Dennis D., William Mendenhall III, William, and Richard L. Scheaffer (2002) Mathematical Statistics with Applications, Sixth Edition. Duxbury Press, Boston: MA. This is the main textbook for this course, we'll follow the material closely and work on problems from this book.

STATA: The software used for this course. Stata is on many of the machines in the computer labs on campus or you may purchase a copy to install on your own machine if you wish. You can order a (student) copy of Stata at <http://www.stata.com/order/new/edu/gradplans/gp3-order.html>. The version you will need for this course is Small Stata, although the more powerful (i.e., more expensive) versions would work of course also. Note: A new version of STATA 9 is now available; the Braker lab has STATA 9 and I'll be using STATA 9 in this class.

Additional References:

Ashenfelter, Orley, Phillip Levine and David Zimmerman (2003) Statistics and Econometrics: Methods and Applications. Wiley, New York, NY. A good reference that encompasses both statistics and econometrics at a low basic to medium level of complexity.

Hogg, Robert V. and Allen T. Craig (1978) Introduction to Mathematical Statistics. Macmillan Publishing Co., New York, NY. This is a classic for an introduction to probability theory and statistics at a more advanced level

Simon, Carl P. and Lawrence Blume (1994) Mathematics for Economists. W.W. Norton and Co., New York, NY. This is one of the most clear and concise modern texts for entering graduate students in the subject. It is rigorous in its mathematics and presents a variety of examples and applications that will be useful in your graduate program.

Wooldridge, Jeffrey (2006) Introductory Econometrics: A Modern Approach, Third Edition. Thompson-South Western, Mason, OH. This is a careful and detailed introduction to Econometrics with special attention to modern developments in theory and practice and up-to-date applications.

COURSE DESCRIPTION

This course focuses on learning and practicing basic statistics at a relatively advanced level. Statistics is the foundation for the study of Econometrics, a key subfield of the economics discipline concerned with measurement of economic phenomena and empirical economic research, and all other subfields of the discipline that make use of risk and uncertainty methods and models.

REVIEW AND BACKGROUND

It will be helpful for you to consult, at the library, any lower level statistics book to build up some foundation for the material in class.

REQUIRED READING

Levitt, Steven and Stephen J. Dubner (2005) Freakonomics: A Rogue Economist Explores the Hidden Side of Everything. William Morrow, NY. This is a widely publicized recent book that synthesizes and explain the works and ideas of Steven Levitt from the University of Chicago. This can be an important source of inspiration for economists and social scientists alike and may be construed as a modern version of Beckerian economics of everyday life. Reading this book along this course is important for your understanding of the use and application of statistical tools to everyday issues.

COURSE OUTLINE (Tentative)

{You are responsible for reading chapters 1 and 2 of Wackerly, Mendenhall and Scheaffer (2002), as well as any chapter on descriptive statistics and probability theory in one of the lower level statistics books}

1. **Discrete Random Variables and their Probability Distributions**, Wackerly, Mendenhall and Scheaffer (2002), Chapter 3 (you are not responsible for sections 3.5, 3.6, 3.7, and 3.10).

2. **Continuous Random Variables and their Probability Distributions**; Wackerly, Mendenhall and Scheaffer (2002), Chapter 4 (you are not responsible for sections 4.7 and 4.11).

3. **(Brief) Introduction to Matrix Algebra**; Wackerly, Mendenhall and Scheaffer (2002), Appendix 1.

4. **Multivariate Probability Distributions**; Wackerly, Mendenhall and Scheaffer (2002), Chapter 5.

5. **Functions of Random Variables**; Wackerly, Mendenhall and Scheaffer (2002), Chapter 6 (you are not responsible for sections 6.3, 6.4 and 6.6).

6. **Sampling Distributions and the Central Limit Theorem**; Wackerly, Mendenhall and Scheaffer (2002), Chapter 7 (you are not responsible for section 7.4).

7. **Estimation**; Wackerly, Mendenhall and Scheaffer (2002), Chapter 8.

8. **Properties of Point Estimators and Methods of Estimation**; Wackerly, Mendenhall and Scheaffer (2002), Chapter 9 (you are not responsible for sections 9.4 and 9.5).

9. **Hypothesis Testing**; Wackerly, Mendenhall and Scheaffer (2002), Chapter 10.

10. **Linear Models and Least Squares Estimation**; Wackerly, Mendenhall and Scheaffer (2002), Chapter 11.