

Agricultural and Consumer Economics 562
Applications of Regression Models I
Fall 2005

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Office Hours: My office hours will be 11-12 am Tuesday and Thursday (after class). I try to make myself as available as possible during other times. You are welcome to stop by. However, it is best to make an appointment by phone or email.

Course Time and Location: 9:00-10:50 am Tuesday and Thursday for the first eight weeks of the semester. We will meet each day in 320 Mumford Hall.

Course Website: The website for this course can be accessed by visiting the ACE WebCT site at <http://webct.ace.uiuc.edu>. To access the ACE 562 pages you must first login. The first time you login your *id* is your *netid* and your *password* also is your *netid*. You will be prompted to change the password for future use. Once logged in, you should see a list of ACE courses you are enrolled in for Fall semester that have WebCT pages. Scroll down to find the site for ACE 562. The website will include the course syllabus, class calendar, lecture notes, homework assignments, exams from previous semesters and links to other statistical sites.

Course Description: This is an introductory graduate-level course on econometrics as applied to problems in agricultural and consumer economics. The objective of the course is to educate students how economic data, economic theory and statistics are used to estimate key economic parameters, test hypotheses and predict economic outcomes.

The course reflects a philosophy that econometrics is best learned within the problem-solving context of applied research. Therefore, the emphasis is not on theory and proofs. Each section of the course will follow the general approach laid out by Griffiths, Hill and Judge in the preface to their text:

- i) begin by identifying a particular economic problem,
- ii) formulate an economic model consistent with the problem,
- iii) introduce statistical assumptions describing the data generation process, thus defining the econometric model,
- iv) identify data that are consistent with the econometric model and note the data's characteristics,
- v) discuss estimation and inference procedures appropriate for the econometric model,
- vi) present empirical results and discuss their implications for the economic model, and
- vii) suggest other models and situations in which the inference procedures discussed might be appropriate.

The course represents the first half of a two-course sequence in econometrics. As such, the emphasis will be almost solely on simple, two-variable regression models. Multivariate regression models are covered in the second course, ACE 564, which is offered in the spring semester.

Expected Background: Students enrolled in ACE 562 are assumed to have taken courses covering introductory statistics, algebra, differential calculus and principles of economics. Unlike many econometrics courses, matrix algebra is not used in ACE 562. Differential calculus is not used extensively. Minimal knowledge of the principles of economics is necessary. However, a thorough understanding of statistics at the introductory level is important. Experience from previous offerings of ACE 562 indicates that nearly all students have taken an introductory statistics course. But, in many cases, the course was taken several years before enrolling in ACE 562. In addition, few students have taken additional coursework in statistics or econometrics beyond introductory statistics. For this reason, the first three weeks of ACE 562 will consist largely of a review of the basic statistical concepts of probability, distributions, random variables and simple estimation. This review will be at a higher level than is typically taught in an introductory statistics course. Therefore, it may be useful for students to take some time and review introductory statistics material. This can be done in several ways. First, students can review their own notes and textbook if they have been saved from an earlier course. Second, students can study the introductory statistics textbook placed on reserve at the Agricultural Library. Third, students can consult some of the highly useful resources available on the Internet. Two of the better on-line texts can be found at:

<http://www.psychstat.smsu.edu/introbook/sbk00.htm>

<http://www.statsoft.com/textbook/stathome.html>.

Links to additional statistical resources can be found at the ACE 562 website.

Required Text and Materials:

Griffiths, W.E., R.C. Hill and G.G. Judge. *Learning and Practicing Econometrics*. John Wiley & Sons, Inc., 1993.

ACE 562 readings packet. Purchase from T.I.S. Bookstore, located at 707 South Sixth Street in Champaign.

ACE 562 lecture notes. Downloaded from the class website. **All students are expected to bring the relevant lecture notes to class each day.**

Other Useful Econometric Texts:

Mirer, T.W. *Economic Statistics and Econometrics, 3rd Edition*. Prentice-Hall, 1995.

Hill, R.C., W.E. Griffiths, and G.G Judge. *Undergraduate Econometrics, 2nd Edition*. John Wiley & Sons, Inc., 2001.

Johnson, A.C., M.B. Johnson, and R.C. Buse. *Econometrics: Basic and Applied*. Macmillan Publishing Co., 1989.

Gujarati, D.M. *Basic Econometrics, 4th Edition*. McGraw-Hill, Inc., 2003.

Pindyck, R.S. and D.L. Rubinfeld. *Econometric Models and Economic Forecasts, 4th Edition*. McGraw-Hill, Inc., 1998.

Kennedy, P. *A Guide to Econometrics, 5th Edition*, MIT Press, 2005.

Maddala, G.S. *Introduction to Econometrics, 2nd Edition*. Macmillan Publishing Co., 1992.

**The previous seven texts are listed in order of increasing difficulty (from top to bottom*

Using Excel:

Gutermuth, K. and R.C. Hill. *Using Excel for Undergraduate Econometrics, Second Edition*. John Wiley & Sons, Inc., 2001.

Teaching Objectives:

As the instructor, I will strive to:

- present clear course objectives,
- be prepared,
- convey a sense of priority by identifying important material,
- present the material in an organized, understandable manner, and lecture at a comfortable rate in order to achieve a basic level of knowledge,
- give adequate time for students to complete assignments and remind students of due dates,
- explain homework assignments thoroughly,
- give fair exams and grade in a fair and consistent manner,
- be accessible to students outside of class,
- be understanding and helpful when students are uncertain of the material,
- be open to questions and encourage group discussions, and
- keep the class upbeat, enthusiastic, and fun.

Examinations: There will be a midterm exam during the course and a final examination at the completion of the course. The midterm will be one hour in length and will not be cumulative. The final will be two hours in length and will be comprehensive. The schedule follows:

Midterm.....Tuesday, September 20th
Final.....Thursday, October 13th

Note: Copies of exams from previous offerings of ACE 562 will be made available at the course website.

Homework Assignments: There will be 5-6 weekly homework assignments. In many ways, these assignments form the core of the course. As one author put it, "The only way to learn to do econometrics is to do econometrics!" The homework assignments typically involve the use of sample data and the application of computer software to answer economic questions. Analytically-oriented questions dealing with statistical concepts may also be included. You will work in teams of two or three students to complete the computer homework assignments. The instructor will assign your team members. Your team will turn in one set of answers and team members will receive the same grade on the assignment. The teams will rotate for each assignment, so that you will work with different classmates throughout the course.

Late homework assignments will be penalized with a 10% reduction (out of 100% for the assignment) per business day.

Software: The computer homework assignments require the use of a spreadsheet program. Any spreadsheet program can be used that has the appropriate statistical functions, but the assignments assume the use of Excel. A spreadsheet program is used in the assignments because ACE 562 students working in business and government report that most of their statistical analysis is conducted using such programs. Note that Excel is loaded and ready to use in the Agricultural and Consumer Economics computer lab located on the 4th floor of Mumford Hall.

It is also possible to use a statistical software package, such as SAS, to complete computer homework assignments. There is considerable value in learning to use a command-based program such as SAS, because such programs allow the user considerable flexibility and the possibility of "customizing" the analysis to the problem at hand. In addition, a small amount of programming can often save a large amount of time in data manipulation and statistical analysis. SAS also is loaded and ready to use in the Agricultural and Consumer Economics computer lab located on the 4th floor of Mumford Hall. If needed, several resource books are available to aid new users of SAS. I highly recommend starting with Delwiche, L.D. and S.J. Slaughter *The Little SAS Book: A Primer, 2nd Edition* SAS Institute, 1998, which covers SAS basics as well as any book I have run across. For problems and examples in econometrics, consult Hill, R.C. *LEARNING SAS: A Computer Handbook for Econometrics* John Wiley & Sons, Inc.,

1993. As a last resort, a complete set of SAS technical manuals can be found in 448 Mumford Hall.

Grading: Final grades for each student in the course will be calculated based on the following weights:

Midterm	25%
Final	40%
Homework Assignments	35%

If you disagree with a grade on an exam, the final, or an assignment, written justification for changing the grade must be submitted to the instructor.

Attendance: Attendance is expected (and hopefully beneficial). However, if you are unable to attend class, make sure you obtain lecture notes and any handouts from someone, since materials may be covered that are not in the readings.

Absences: Please let me know in advance (if possible) if you will miss a class due to an excused absence such as 1) illness, 2) serious illness or death in your immediate family, 3) University-sanctioned field trip, or 4) religious holiday. Written justification for an absence is required to make up an exam or assignment.

Cheating and Plagiarism: All University policies will be strictly followed. Don't do it.

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Course Outline

Lecture 1. Introduction To Econometrics and Applied Research

Required Readings:

Learning and Practicing Econometrics, Chapters 1 and 26
Elements of Forecasting, Chapter 3 (readings packet)

Lecture 2. Probability, Random Variables and Distributions

Required Readings:

Learning and Practicing Econometrics, Chapter 2
Economic Statistics and Econometrics, Chapters 9 and 10 (readings packet)
Gilovich, *et. al.* "The Hot Hand in Basketball: On the Misperception of Random Sequences" (readings packet)

Optional Reading:

Economic Statistics and Econometrics: Chapters 8

Lecture 3. Statistical Inference: Estimating the Mean and Variance of a Normal Population

Required Reading:

Learning and Practicing Econometrics, Chapter 3

Lecture 4. Simple Linear Regression Model: Specification and Estimation

Required Reading:

Learning and Practicing Econometrics, Chapter 5

Lecture 5. Simple Linear Regression Model: Sampling Properties of the Least Squares Estimators

Required Reading:

Learning and Practicing Econometrics, Chapter 6

Lecture 6. Simple Linear Regression Model: Interval Estimation and a Monte Carlo Experiment

Required Readings:

Learning and Practicing Econometrics, Sections 7.1 and 6.5

Lecture 7. Simple Linear Regression Model: Hypothesis Testing

Required Readings:

Learning and Practicing Econometrics, Chapter 4 and Section 7.2

Lecture 8. Simple Linear Regression Model: R^2 , Reporting the Results and Prediction

Required Readings:

Learning and Practicing Econometrics, Sections 8.1, 8.2 and 7.3