

Agricultural and Consumer Economics 564
Applications of Regression Models II
Spring 2006

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Office Hours: My office hours will be 11 am-12 pm Monday, Wednesday and Friday. 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: 2:00-3:50 pm Tuesday and Thursday for the first eight weeks of the semester. We will meet each day in 316S 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 564 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 Spring semester that have WebCT pages. Scroll down to find the site for ACE 564. The website will include the course syllabus, class calendar, 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 economics. The objective of the course is to train students how economic data are used with economic theory to estimate key economic parameters, test economic 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 Hill, Griffiths, 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 second half of a two-course sequence in econometrics. As such, the emphasis is on extensions of the simple linear regression model and the multiple regression model.

Expected Background: Students enrolled in ACE 564 are assumed to have taken courses covering introductory statistics, algebra, differential calculus, principles of economics and the simple linear regression model. While ACE 562 is not a required pre-requisite, it is quite beneficial if a student has taken this course before enrolling in ACE 564. Unlike many econometrics courses, matrix algebra is not used in ACE 564. Differential calculus is not used extensively. Minimal knowledge of the principles of economics is necessary.

Required Texts:

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

Kennedy, P. *A Guide to Econometrics*. 5th ed., MIT Press, 2003.

ACE 564 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.

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

**The previous six 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.....Thursday, February 9th
Final..... Thursday, March 9th

Note: Copies of exams from previous offerings of ACE 564 will be made available at the course website. There will also be a help session scheduled outside of regular class hours before the midterm and final.

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 564 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 a homework assignment, written justification for changing the grade must be submitted to me.

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 a quiz or exam.

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

Students with Special Needs: I will do my best to accommodate students with special needs. Please make sure that you contact me early in the semester, definitely before the midterm exam.

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Course Outline

Lecture 1. Extensions of the Simple Linear Regression Model I: Choosing the Functional Form

Required Readings:

Learning and Practicing Econometrics, Sections 8.3, 8.5

Economic Statistics and Econometrics, “Functions and Graphs,” “Logarithms” and “The Coefficients in Logarithmic Models”*

Lecture 2. Extensions of the Simple Linear Regression Model II: Regression through the Origin, Scaling, and Time Series Forecasting

Required Readings:

Econometric Models and Economic Forecasts, Chapter 8*

A Guide to Econometrics, Chapter 18

Lecture 3. The Multiple Regression Model: Specification and Estimation

Required Readings:

Learning and Practicing Econometrics, Sections 9.1-9.2

Lecture 4. The Multiple Regression Model: Sampling Properties and Interval Estimation

Required Readings:

Learning and Practicing Econometrics, Sections 10.1-10.2

Lecture 5. The Multiple Regression Model: Hypothesis Testing for a Single Parameter, Goodness of Fit and Reporting the Results

Required Readings:

Learning and Practicing Econometrics, Sections 10.3-10.5

A Guide to Econometrics, Chapter 4

Lecture 6. The Multiple Regression Model: Joint Hypothesis Testing

Required Readings:

Learning and Practicing Econometrics, Sections 10.6-10.8

A Guide to Econometrics, Chapter 4

Lecture 7. Extensions of the Multiple Regression Model: Dummy Independent Variables

Required Readings:

Learning and Practicing Econometrics, Chapters 12

A Guide to Econometrics, Chapter 14

Lecture 8. Violations of Basic Assumptions I: Multicollinearity and Non-Sample Information

Required Readings:

Learning and Practicing Econometrics, Chapters 11, 13

A Guide to Econometrics, Chapters 11-12

Lecture 9. Violations of the Basic Assumptions II: Heteroskedasticity

Required Readings:

Learning and Practicing Econometrics, Chapter 15

A Guide to Econometrics, Sections 8.1-8.3

Lecture 10. Violations of the Basic Assumptions III: Autocorrelation

Required Readings:

Learning and Practicing Econometrics, Chapter 16

A Guide to Econometrics, Section 8.4

Lecture 11. Violations of Basic Assumptions IV: Specification Errors

Required Readings:

Learning and Practicing Econometrics, Sections 9.5, 10.9-10.10

A Guide to Econometrics, Chapters 3, 5, and 6

Note that readings with a star will be provided by the instructor.