

Syllabus

Course credits: 4 (two 80-minute lectures and one 50-minute lab per week)

Required textbook: Econometric Analysis, by William H. Greene, published by Prentice Hall Press. Available for purchase at university bookstores and on the Internet. I will use the 5th edition, but you may want to get the newly released 6th edition.

Course content:

This is the first course in an econometrics sequence at the graduate level. It covers a large number of topics fairly quickly to prepare students for subsequent econometrics courses. The course is based directly on Appendices A–D in the Greene text (5th edition) and includes:

- A. Matrix algebra
- B. Probability and distribution theory
- C. Estimation and inference
- D. Large sample distribution theory

Pre-requisites:

1. MTH 253 (Infinite Series and Sequences)
2. ST 351 (Intro to Statistical Methods)
3. ST 352 (Intro to Statistical Methods) or ECON 424/524 (Intro to Econometrics)

Meeting time: Monday and Wednesday, 10:00-11:20, Gilkey 108
Friday lab, 1:00-1:50, MCC 201

Instructor: Jeff Reimer (email: jeff.reimer@oregonstate.edu)

Office: 220 Ballard Extension Hall

Office hours: Monday and Wednesday 11:30 to 1:00; feel free to stop in at any other time

Useful references:

- Introduction to Mathematical Statistics, by Robert Hogg and Allen Craig
- Statistical Inference, by George Casella and Roger Berger

Evaluation of student performance:

Your course grade will be based on three problem sets using SAS-IML (15%), two midterm exams (25% each), and a final exam (35%).

Students with Disabilities:

Accommodations are collaborative efforts between students, faculty and Services for Students with Disabilities (SSD). Students with accommodations approved through SSD are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through SSD should contact SSD immediately at 737-4098.

Expectations for Student Conduct (cheating policies):

Oregon State University defines academic dishonesty as: “An intentional act of deception in which a student seeks to claim credit for the work or effort of another person or uses unauthorized materials or fabricated information in any academic work.”

Academic dishonesty includes: Cheating, Fabrication, Assisting, Tampering, Plagiarism. More information, including the process by which academic dishonesty cases are handled, is available at: <http://oregonstate.edu/admin/stucon/achon.htm>

Fall 2007 Schedule

(Make-up exams are generally offered only for verifiable emergencies)

Monday, September 24	Lecture 1 - Matrix algebra (App. A, 5 th edition)
Wednesday, September 26	Lecture 2 - Matrix algebra (App. A)
Monday, October 1	Lecture 3 - Matrix algebra (App. A)
Wednesday, October 3	Lecture 4 - Matrix algebra (App. A)
Monday, October 8	Lecture 5 - Probability and distribution theory (App. B)
Wednesday, October 10	Lecture 6 - Probability and distribution theory (App. B)
Monday, October 15	Exam 1 (80 minutes)
Wednesday, October 17	Lecture 7 - Probability and distribution theory (App. B)
Monday, October 22	Lecture 8 - Probability and distribution theory (App. B)
Wednesday, October 24	Lecture 9 - Probability and distribution theory (App. B)
Monday, October 29	Lecture 10 - Estimation and inference (App. C)
Wednesday, October 31	Lecture 11 - Estimation and inference (App. C)
Monday, November 5	Lecture 12 - Estimation and inference (App. C)
Wednesday, November 7	Exam 2 (80 minutes)
Monday, November 12	Lecture 13 - Estimation and inference (App. C)
Wednesday, November 14	Lecture 14 - Estimation and inference (App. C)
Monday, November 19	Lecture 15 - Large sample distribution theory (App. D)
Wednesday, November 21	Lecture 16 - Large sample distribution theory (App. D)
Monday, November 26	Lecture 17 - Large sample distribution theory (App. D)
Wednesday, November 28	Lecture 18 - Large sample distribution theory (App. D)
Thursday, December 6, 6:00 pm	Final exam (110 minutes)

Topics covered

Appendix A. Matrix Algebra (5th edition)

Structure of matrices and vectors

Vector and matrix operations

Identity matrix

Projection matrices

Vector spaces

Basis vectors

Linear independence

Determinants

Rank

Systems of equations

Properties of inverses

Orthogonality and the least squares problem

Kronecker products

Characteristic roots and vectors

Trace

Quadratic forms and definite matrices

Comparing the 'size' of two matrices

Applications of projection matrices

Appendix B. Probability and distribution theory

Random variables

Distribution functions

Expectations

Moments of random variables

Moment generating functions

Important probability distributions

Joint densities

Covariance and Correlation

Independence

Conditional distributions

Functions of random variables

Distributions of functions of variables

Multivariate distributions

Appendix C. Estimation and inference

Types of non-experimental data

Common descriptive statistics

Sampling

Estimators

Ways of estimating parameters

Point and interval estimates

Method of moments

Maximum likelihood

Least squares

Seeking the 'right' estimator: Small sample properties

Unbiasedness

Precision

Efficiency: Minimum Variance Unbiased Estimator

Information matrix

Cramér-Rao lower bound

Linearity

Hypothesis testing

Appendix D: Large sample distribution theory

Seeking the 'right' estimator: Large sample properties

Sequences of random variables

Limit laws

Chebyshev's inequality

Convergence in probability

Convergence in mean square

Consistency

Laws of large numbers

Convergence in distribution

Univariate central limit theorem

Lab Schedule

Friday, September 28	No lab
Friday, October 5	Lecture 1 in SAS/IML
Friday, October 12	Teaching Assistant is available in lab
Friday, October 19	HW 1 due at beginning of lab; HW 2 handed out
Friday, October 26	Teaching Assistant is available in lab
Friday, November 2	HW 2 due at beginning of lab; HW 3 handed out
Friday, November 9	Teaching Assistant is available in lab
Friday, November 16	No lab; HW 3 due by 1:00 pm
Friday, November 23	No lab
Friday, November 30	No lab

** If problem sets are late they may be turned in any time until the last day of class. However, your score will be lowered by 30%.