

Course Information

Econ 3818 is a first course in probability and statistics, with an introduction to econometrics. Applications will be taken from topics in economics, and other areas. Both simulated and real data will be used in these examples.

Instructor

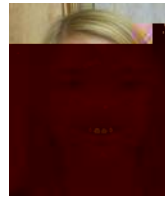
Donald M. Waldman, Professor



waldman@colorado.edu
Office: Econ 108
Tues, Thurs: 2 pm - 3:15 pm

Teaching Assistant

Nicole Mundt, Ph.D. Student



Nicole.Mundt@colorado.edu
Office: TBD

Instructor Short Biographies

Donald Waldman is a professor in the Economics Department. Both his teaching and research concentrate on statistical methods (econometrics) and applied microeconomics (environmental economics, nonmarket valuation, labor economics, industrial organization). He has taught this course many times.

Nicole Mundt is a graduate student in the Economics Department. She has just completed the Ph. D. level course in statistics in the Economics Department.

Prerequisites

The most important background to bring into this course is ability to think abstractly. In addition, students will find it easier if they have a good understanding of algebra at the level of high school Algebra II; differential and integral calculus play a smaller role in this course, but they will be used. Calculus will be reviewed during the course.

The course prerequisites are *one* of the following:

- ECON 1078 and 1088;
- MATH 1300;
- MATH 1310;
- MATH 1081;
- MATH 1080, 1090, and 1100;
- APPM 1350.

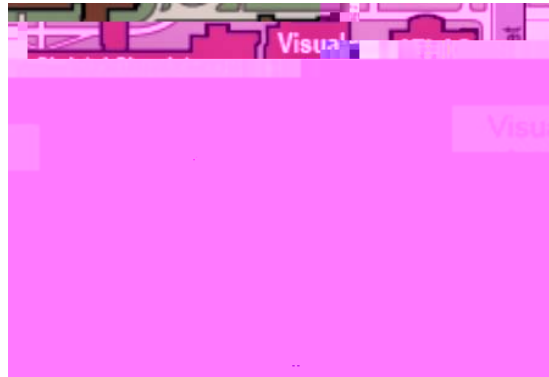
If you have not taken one of these classes, you cannot take Econ 3818 without a waiver.

In the first week of class:

- Please read Caniglia (the course textbook), Chapter 2.

Lectures, Recitation, Work Load

There will be two lectures weekly, meeting Tuesday and Thursday from 3:30 to 4:45 p.m. in the Visual Arts Complex, room 1b20.



Attendance is mandatory!!! It is possible to learn statistics by reading the text, but it is not desirable. You will learn the subject as it applies to economics much better by attending class. In addition, you will help your classmates by being part of the group, asking questions during lecture, collaborating in working out in-lecture exercises, and

Course Outline

The course begins with *probability*, continues with *statistics*, and ends with *econometrics*.

The following is a list of sections, one covered roughly every three weeks. This list may be useful to you to see where we are in the text or if you have had a statistics course previously (but I expect it will have little meaning to most of you at this point).

Section 1

- Research in “Hard” and “Soft sciences
- Introduction to probability. Axioms; Venn diagrams
- Addition and complement rules of probability
- Conditional probability
- Tree diagrams
- Independence and mutual exclusivity
- Bayes' law
- Urn problems
- Bayes' Law for partitions

Section 2

- Random variables and probability distributions
- Discrete random variables; the probability mass function
- Bernoulli, binomial, and Poisson random variables
- Mathematical expectation
- Expectation of a function of random variables; variance
- Continuous random variables; the probability density function
- The power, exponential, and standard normal distribution
- Bivariate, marginal, and conditional distributions
- Conditional expectation and variance
- Covariance and correlation

Section 3

- The general normal distribution
- From probability to statistics - population and sample
- Sampling theory - the distribution of the sample mean
- The Central Limit Theorem
- The chi-squared distribution
- Point estimation
- Unbiasedness as a property of an estimator
- Relative efficiency and best (minimum variance estimation)
- Examples from portfolio theory
- Comparing biased and unbiased estimators--mean-squared error
- Maximum likelihood estimation

- Confidence intervals

Section 4 - hypothesis testing

- Introduction - the State of Nature and the outcome of a test
- Type I and Type II errors. The power of the test
- Testing hypotheses about the population mean - classical method
- p-value and the p-value method of testing hypotheses
- Using confidence intervals
- Testing hypotheses about the population proportion
- Some caveats in testing hypotheses

Section 5 - the classical, normal, linear regression model

- Model specification and assumptions
- Estimation and hypothesis testing
- Prediction and goodness-of-fit
- Multiple regression
- Review

Text

Caniglia, Statistics for Economists, An Intuitive Approach, Harper Collins Publisher, 1992. This book is out of print, but available in soft cover at the CU bookstore for \$60. Since there is no disk or key to unlock a publisher web site associated with this book, and since there is only one edition, any used copy is equivalent to a new copy. The text has been used for this course at CU extensively for the last three years, so that it is available on all the second hand book sites, on line (3rd party through Amazon, currently starting at \$16), and other places.

Grading Criteria

- *Quizzes* (15%)
- *Weekly Problem sets* (20%)
- *Three midterm exams* (15% each)
- *Final exam* (20%)

Course grades will be assigned based upon overall percentage course score:

93 - 100	A
90 - 92	A-
87 - 89	B +
84 - 86	B
80 - 83	B -
75 - 79	C +
70 - 74	C
65 - 69	C -
60 - 64	D
< 60	F

Notes

- The weekly 15 minute quiz is taken online at the end of the week. It will consist of
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Students with Disabilities and the Honor Code

Notice for students with disabilities: