

University of Colorado at Boulder  
Department of Economics  
Econ 3818-100 - Introduction to Statistics with Computer Applications  
Instructor - Paulo Saraiva  
Summer 2013

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Office: Econ 14  
Class Meetings: MTWRF 9:15am - 10:50am, Econ 117  
Office Hours: MTWR 10:50am - 12:20pm.

course. Lectures are sequential in this course, so missing class and not studying

Amemiya, T. (1994) *Introduction to Statistics and Econometrics*. Harvard University Press, Cambridge, MA.

Ashenfelter, O., P. Levine & D. Zimmerman (2006) *Statistics and Econometrics: Methods and Applications*. John Wiley & Sons, New York, NY.

Bradley, T. (2007) *Essential Statistics for Economics, Business and Management*. John Wiley & Sons, New York, NY.

Johnson, R. & G.K. Bhattacharyya (2010) *Statistics: Principles & Methods* (6th edition). John Wiley & Sons, New York, NY.

Spanos, A. (1999) *Probability Theory and Statistical Inference: Econometric Modeling with Observational Data*. Cambridge University Press, New York, NY.

Chiang, A. & K. Wainwright (2005) *Fundamental Methods of Mathematical Economics*. McGrall-Hill, New York, NY.

Course outline:

1. Set Theory

Unions and Intersections

De Morgan's Law

Functions

2. Probability

Axioms of Probability

Combination and Permutation

Conditional Probability

Independence

Bayes Theorem

3. Random Variables

Distribution Function

Discrete Random Variable and Probability Mass Functions

Continuous Random Variables and Density Functions

Conditional Distributions

Independence of Random Variables

4. Moments and Expectations

Mean, Mode and Median

Variance and Standard Deviation

Covariance and Correlation

5. Useful Distributions

Bernoulli Distribution

Binomial Distribution

Poisson Distribution

Uniform Distribution

Normal Distribution

Chi-squared Distribution

t-Student Distribution

F Distribution

6. Estimation and Inference

Method of moments estimator

Bias, Efficiency and Mean Squared Error

Test Hypothesis

Interval Estimation

7. Asymptotic Theory (if time permits)

Convergence in  $r$ -th mean

Almost Sure Convergence

Convergence in Probability

Convergence in Distribution

Law of Large Numbers

Central Limit Theorems

Hypothesis Testing without the Normality Assumption

Exam Material: Based on the items of the course outline:

Exam	Material
Midterm 1	1 and 2
Midterm 2	3 and 4
Final Exam	5, 6 and 7

Miscellaneous:

Hardware and Software: R will be used for some data analysis. Although not required, there are many excellent R manuals available. R is supported in many of the campus computer labs, including the lab in the basement of the Economics building. R is an open source program which can be downloaded in <http://cran.r-project.org/>. You may use other softwares, such as Excel, however, I will not cover Excel in this class. In addition to this you will need a calculator for the exams.

Visit <http://webdata.colorado.edu/labs/map/> for a list of computer laboratories and available software.

Special accommodations:

Refer to <http://www.colorado.edu/disabilityservices>.

E-Mail Policy: I will not answer questions about statistics via email. Those emails with questions about statistics will be ignored. If you should have any questions, please come to office hours or ask during class as the material is being presented. I will not answer any question on an email in which the answer can be found on the syllabus. I do not repeat in class announcements in emails.

Participation: Participation is highly recommended. No question shall be labeled "stupid" and I will not tolerate disrespect to one's question, answer or observation.

Office hours: If you wish to use office hours you must inform me you intend to do so. I will not give away answers to problem sets during office hours. During office hours I will answer specific questions about the material. However, if the question is of the type, "How do I answer this question of the problem set", and you have not yet handed in the problem set, I will not answer it.

Make up work: There is no make up exams.

Late work: Work handed in late will have 30% taken away from it. After that, 10% will be marked off for each day the work have not been handed in.

Let-me-google/D2L-that-for-you questions: I reserve the right to ignore any question that can be answered by careful reading of this syllabus or any distributed material. For example, I reserve the right to not answer questions of the type: "When are your office hours?"; "Where is your office?"; "Where can I get the software R?"; "Is the final exam cumulative?"; "When is homework 1 due?" etc.

Enjoy!