Rutgers University
The State University of New Jersey
Department of Economics - CCAS
Fall 2016

Class Information

Course Title: Foundations of Econometrics (index#18488)
Economics 222/Section 01

Instructor: Dr. I-Ming Chiu

Office: ARMITAGE 328
Phone (856) 225 6012

E-mail address: ichiu@camden.rutgers.edu

Class Meeting: BSB 133. 9:30-10:50 AM (Tuesday/Thursday)

Office Hours: 8:20-9:20 AM/Tuesday, 2:30-3:30 PM/Thursday or by appointment

Course Description: This class shows students how to apply modern statistical methods to explore and quantify the essential variables used in business, economics, and social sciences. The class begins with a detailed introduction on set theory, random variable, probability distributions (discrete and continuous), and statistical inferences. Some important linear algebra tools, such as matrix operations, will also be introduced. After gaining a solid understanding on fundamental concepts in probability theory and statistical inference, the class continues to introduce students to experimental data, analysis of variance, and data fitting using the linear regression models, where the dependent variable can be either discrete or continuous. Bayesian statistics will also be covered if time is allowed. We will utilize data sets from different fields of social sciences to implement all the statistical methods. The ultimate goal of this class is to equip students with quantitative and analytical skills, which are essential in today's dynamic workplace.

References: David M Diez, Christopher D Barr, and Mine Çetinkaya-Rundel, OpenIntro Statistics, 3rd Edition, OpenIntro Inc., 2015. The printed copy is available at the bookstore for purchase and the online edition is free for download at the following web site:

https://www.openintro.org/stat/textbook.php?stat_book=os

Jay L Devore and Kenneth N. Berk, Modern Mathematical Statistics with Applications, 2nd Edition, Springer, 2012.

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Kyle C. Longest, Using Stata for Quantitative Analysis, 2nd Edition, Sage, 2015 (the printed copy is available at bookstore for purchase).

Alain F Zuur, Elena N Ieno, and Erik HWG Meesters, A Beginner's Guide to R, Springer, 2009.

Gary Oehlert, A First Course in Design and Analysis of Experiments, W. H. Freeman, 2000.

(Download site: http://users.stat.umn.edu/~gary/book/fcdae.pdf)

Computing: All the computations will be done using statistical software R & Stata. The virtual implementation of Stata can be found at the following site: https://apps.camden.rutgers.edu/novnc/ (NetID login is required). The R software is free for download at http://www.r-project.org.

R Installation: https://www.youtube.com/watch?v=Icawuhf0Yqo (for Mac)
https://www.youtube.com/watch?v=hxj0UG4boGU (for PC)

Class Material: Data, handouts, readings, and homework problems will be posted on **Sakai** web site.

Useful Websites: http://www.ats.ucla.edu/stat/(Learning Stata)

http://www.statmethods.net/ (Computing using R web site)

Fall '16 Calendar: http://registrar.camden.rutgers.edu/academic-calendar-2016-2017

Grading: **Contribution to Final Grade**

- Attendance	5%
- Take-home problems	30%
- Midterm Exam (2)	40%
- Final Exam/Project	25%
- Participation (extra credit)	5%

Grading Policy: Term grades will be based on the final distribution of the above grading weights.

Exam Preparation: The exam questions will be drawn from three sources: (i) homework assignments, (ii) course lectures, and (iii) reading material.

Class Participation: Class attendance is essential for learning achievement. When missing a class, it would cost you more time to learn on your own. I strongly recommend the following steps for your successful learning: (1) attend every class and take notes; (2) review everything you learn from the class immediately, never put it off; (3) ask questions and participate in class discussions.

Academic conduct: Make up exams will be given **only upon prior notice**. I request prior knowledge of any expected absence from an exam. If this is not feasible, you can document a valid reason for missing the exam. Unexcused absence on any exam will result in a grade of zero. Dishonesty in seeking an excused absence or in the examination process will result in a grade of zero on the exam involved and in university discipline.

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Course Outline:

Topic 1	Data Types & Introduction to R & Stata
Topic 2	Mathematical Preliminaries
Topic 3	Probability Theory
Topic 4	Discrete/Continuous Random Variables and Probability Distributions
Exam 1	**Date: TBA in the class**
Topic 5	Sampling Distributions and Major Statistical Theorems
Topic 6	Statistical Inferences: Point Estimation, Confidence Interval and Hypothesis Testing
Topic 7	Introduction to the DOX and ANOVA
Exam 2	**Date: TBA in the class**
Topic 8	Joint, Marginal and Conditional Distributions
Topic 9	Conditional Mean Function & Linear Regression Models
Topic 10	What's Bayesian? Frequentist vs Bayesian Thinking
Final Exam (school schedule)	**8:00 - 11:000 AM, Thursday, December 22.**