

Syllabus for Econ 506: Advanced Economic Statistics
Rutgers University
Department of Economics

Contact Details

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Course Details

Lecture Time: Wednesday 1:10pm – 4:10pm, Hardenburg Hall A3

Recitation: Tuesday 11:30am – 12:50pm, Scott Hall 204

Course Overview

This course is designed to introduce you to the topics of statistics and probability that you will find useful as you pursue a graduate education in Economics. You will be introduced to basic probability and statistical inference topics, to the common univariate and multivariate distributions, and to the large sample results needed to apply your newly acquired knowledge to applied problems in economics.

Learning Goals

At the end of this course you should be literate in statistical methods which will allow you to conduct rigorous economic research as you proceed through the graduate program. Assessment will be based on exams and homework assignments.

Texts

The text for the class is

“Introduction to Mathematical Statistics (7ed),” by Robert V. Hogg, Joseph W. McKean, and Allen T. Craig. Pearson, ISBN 978-0-321-79543-4.

This is an excellent introduction to Mathematical Statistics and will be a valuable resource for the future. This book is intended for a two semester course in statistics so I will not be covering all material in the text with the same degree of thoroughness so it is important that students read the text as well as attend classes.

Topics to be Covered

1. Introduction to Probability Concepts (Chapter 1)
 - Set theory
 - Random variables
 - Expectation of a random variable
 - Some useful inequality results
2. Multivariate Distributions (Chapter 2)
 - Expectation
 - Dependence
 - Correlation
 - Independence
 - Transformations of several random variables
 - Linear combinations of random variables
3. Some common univariate and multivariate distributions (Chapter 3)
4. Introduction to Statistical Inference (Chapter 4)
 - Sampling

- Hypothesis testing
 - Confidence Sets
 - Order statistics
 - Computational methods
 - Monte Carlo methods
 - the bootstrap
5. Large Sample Results (Chapter 5)
- Consistency
 - Convergence in distribution
 - CLT's
6. Likelihood Methods (Chapter 6)
7. Additional Topics
- sufficiency and optimality of hypothesis tests
 - inferences under the assumption of Normality
 - The Bayesian approach.

Course Evaluation

The final grade for this course will be determined by your performance in regular homework assignments, a mid-term exam and the final exam. The breakdown of weight given to each component is as follows:

Assignments: 30%

Mid-term exam: 30%

Final exam: 40%

Exam dates:

To be announced.

Office Hours

My formal office hours will be on Tuesday and Thursday from 2.00pm until 3pm. I can meet students outside of these office hours by appointment only.