

ECON 6331— Quantitative Economic Analysis: Probability and Statistics

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WEB-page: the class WEB-page will be accessible from my home-page: www.uh.edu/~bsorensen

Hours: By appointment or just drop by (in the case of drop-by I may occasionally be too busy, but don't let that be a discouragement). It is essential for serious study that you ask me or the TA when the seems unclear to you.

Learning Outcomes:

- Students will learn, through lectures, homeworks, and TA-sessions, to master probability theory at a level that, in conjunction with other core-classes, enables the students to read research articles in leading journals.
- Students will develop their mathematical maturity to the level expected in graduate economics programs.
- Students will develop the methods of probability theory that are necessary in order to do independent research in most fields of specialization within economics.

Course Description

Readings:

Textbooks: Ramu Ramanathan [R]: *Statistical Methods in Econometrics*, Academic Press 1993. We will follow the book quite closely. We will cover most of the first 5 chapters and as much as we get to in chapters 6 and 7.

This book is written by an econometrician and it therefore aims directly at preparing you for econometrics. In terms of difficulty it is somewhat uneven—it aims to cover the statistics that economists *should* know, whether it is “hard” or not. You need to understand the concepts covered in class—it is less essential that you understand every word in the book. (Do NOT read material that we don't cover.)

Some good supplementary texts are:

Hogg and Tanis [HT]: *Probability and Statistical Inference*. Latest edition, Prentice-Hall. (This book is quite thorough and fairly accessible and you may want to use it as a supplement to the first part of the course where you find R to be too thin. (Note: For the first year it is not advisable to read too much material that is not directly relevant to the exam; so your focus should be the class notes.) HT is not directly written for econometricians and doesn't cover some of the material

(such as the multivariate distributions.)

George Casella and Roger Berger [CB]: *Statistical Inference*, 2nd edition, Wadsworth 2002. (This text is more advanced. It is quite good if you want to make the effort. It may make sense for students who want to specialize in econometrics to get to know this book.) (If you want to specialize in theoretical econometrics, you have to also take classes in the math department.)

William Greene: *Econometric Analysis*. Prentice-Hall. (This is a mainstream econometrics book used numerous places as the main introduction to graduate econometrics. One major goal of the course is to give you the background for texts like that. The book has introductory chapters that list the statistical theory underlying econometrics—the theory this class covers. Greene’s summary may be a useful compact source to consult.)

Notes Supplementary notes may be posted on the class WEB-page.

Material covered: Basic probability and random variables, probability distributions (with particular focus on the normal distribution and the distributions derived from the normal). The multivariate normal distribution (central for econometrics) makes up a large fraction of the material. (Check last years detailed syllabus...I hope to get a little further this semester but usually I don’t get to hypothesis tests.)

Grading and assignments: There will be 2 midterms, a final, and 6–8 homework assignments. Grades will be based on the mid-terms (20% each), home-works (20%), and a final (40%).

Teaching Assistant: The TA is Wided Hmissi. She will grade the homework assignments. Her office hours are Thursday 11.30–1.00 in rm 207.

General advice: Make sure you understand the material after each topic is covered (don’t suffer from the illusion that you will understand it better when exam-time draws near). If the point of some topic is not clear, ask questions in class and *see me in my office*—this is part of good study habits and without good study habits graduate studies don’t go far. You can also email questions to me. There really is only one dumb question, and that is the un-asked question. Why spend hours on something the teacher may be able to clear up in 2 minutes? I could go on, but you should consider it your duty to yourself to seek advice.

In general, I try to do proofs in class and if you try to participate it will help you a lot (the purpose of this is to try and focus on how to approach a proof, rather than trying to present slick proofs).