

Economics 7818  
Office: Room 108

August, 2017  
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Office Hours: Tuesday: 2:00 - 3:00,  
Wednesday: 11 - 12, and by appointment

### Course Information

**General:** Economics 7818 is a course in mathematical statistics for economics Ph.D. students. It is followed by Economics 7828, a course in regression analysis. Together, Econ 7818 and 7828 are the core courses required for taking the preliminary exam in quantitative methods.

**Prerequisites:** An undergraduate course in statistics; calculus, to the level of multiple integration with transcendental functions (*e.g.*  $\log$ ,  $1/x^b$ , etc.); the ability to manipulate and simplify algebraic expressions, and (most importantly) the ability to complete weekly problem sets (usually, end-of-chapter Exercises from the text, and other problems) throughout the semester.

**Grading:** Grades will be determined approximately as follows:

Midterm:	30%
Final exam:	40%
Problem Sets:	30%

**Texts:** Introduction to Statistics and Econometrics

\_\_\_\_\_, Takeshi Amemiya, Harvard, 1994.

**Tentative Course Outline:** We will cover, roughly in order, some or all parts of the first nine chapters of the text. After a brief introduction to what empirical economists do, we will discuss probability; univariate and multivariate discrete and continuous random variables (especially the normal distribution); mathematical expectation; sampling distributions; large sample (asymptotic) theory; methods of estimation; and hypothesis testing.

**Practice Problems:** The end-of-chapter exercises are valuable learning experiences, but it is not expected or required that you do all of them. I will assign some of these problems, as well as other exercises, for problem sets. Answers to selected problems will be posted after assignments are due.

Problem sets will be posted on the course web site. Written answers to problems are to be submitted before the answers are posted. These will be selectively graded, and returned. I will take some midterm and final exam questions from problem set exercises.

Additional resources:

For those who wish a more rigorous treatment of the material, see Jun Shao, Mathematical Statistics, Springer 2003, or

George G. Roussas, A First Course in Mathematical Statistics, (Addison Wesley, but out of print), available in pdf form (free) at:

[http://www.lce.esalq.usp.br/arquivos/aulas/2012/LCE5806/A\\_course\\_in\\_mathematical\\_statistics\\_George\\_G.\\_Roussas\\_p593.pdf](http://www.lce.esalq.usp.br/arquivos/aulas/2012/LCE5806/A_course_in_mathematical_statistics_George_G._Roussas_p593.pdf)

I will occasionally take material from Introduction to Mathematical Statistics, by Hogg, McKean, and Craig (Pearson 2013).