Fall 2002 **Dr. Kohlhase**
MW 10:30-12:00pm, 212-M

ECON 6331
QUANTITATIVE ECONOMIC ANALYSIS: PROBABILITY AND STATISTICS

OFFICE: 201B McElhinney, 713-743-3799
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TEACHING ASSISTANT: To be announced

OVERVIEW OF COURSE: This is a first-year graduate course in probability and statistics and should be viewed as a preparatory course for Econometrics I, Econ 7331, offered in the Spring. This course will provide a basic guide to probability, probability distributions (both discrete and continuous), estimation, properties of estimators, and hypothesis testing. Important topics to be covered include moment generating functions, the Central Limit Theorem, Chebyshev's Inequality, and Cramer-Rao Lower Bounds. Students are expected to be proficient in elementary calculus, including differentiation and integration (both univariate and multivariate). See *Appendix A* in the text for a review of selected mathematical techniques to be used in the course. Also see the math econ texts by Chiang and Simon & Blume available on reserve in the library. The course may occasionally use computer simulation models using the PC program *MAPLE* or *Mathematica*.

REQUIRED TEXT: Robert V. Hogg and Elliott A. Tanis, *Probability and Statistical Inference*, 6th edition, Prentice-Hall, 2001.

OTHER BOOKS: (on reserve at M. D. Anderson Library)
R. V. Hogg and A. T. Craig, *Introduction to Mathematical Statistics*, 5th ed., Prentice-Hall, 1995. A more advanced treatment.

A.C. Chiang, *Fundamental Methods of Mathematical Economics*, 3rd ed., McGraw-Hill, 1984. An intuitive review of math used in economics.

C.P. Simon and L. Blume, *Mathematics for Economists*, Norton, 1994. A more advanced treatment of the mathematics typically used in economics.

COURSE REQUIREMENTS:

20%	Midterm I
20%	Midterm II
40%	Final
20%	Homework Sets

COURSE POLICY: Homeworks must be completed and handed in on time. **NO MAKEUP EXAMS!**

TOPIC	**TEXT**
I. *Introduction*	1.1-1.3
II. *Probability*	2.1- 2.4
III. *Discrete Distributions*	
A. Basics	3.1, 3.2
B. Bernoulli Trials and Binomial	3.3
C. Moment-Generating Functions	3.4
D. Poisson Distribution	3.5
IV. *Continuous Distributions*	
A. Basics	4.1
B. Uniform and Gamma	4.2
C. Gamma and Chi-Squared	4.3
D. Normal Distribution	4.4
E. Distributions of Functions of Random Variables	4.5
V. *Multivariate Distributions*	
A. Basics	5.1
B. Correlation	5.2
C. Conditional Distributions	5.3
D. Bivariate Normal	5.4
VI. *Sampling Distribution Theory*	
A. Basics	6.1-6.3
B. Central Limit Theorem	6.4
C. Approximations for Discrete Dist.	6.5
D. t- and F-distributions	6.6
E. Chebyshev's Inequality	6.8
VII. *Estimation*	
A. Point Estimation	7.1
B. Confidence Intervals for Means	7.2-7.3
C. Confidence Intervals for Variances	7.4
D. Confidence Intervals for Proportions	7.5
E. Sample Size	7.6
VIII. *Hypothesis Testing*	
A. Proportions	8.1
B. Equality of 2 Normal Distributions	8.3
C. Kolmogorov-Smirnov Goodness of Fit	8.10
D. Resampling Methods	8.11
IX. *Theory of Statistical Inference*	
A. Sufficient Statistics	9.1
B. Power	9.2
C. Critical Regions	9.3
D. Likelihood Ratio Tests	9.4
E. Cramer-Rao Lower Bounds	9.6