MATHEMATICS 323
"INTRODUCTION TO MATHEMATICAL STATISTICS"
Summer 2004
Syllabus and Important Dates.

NOTE: <u>All quizzes</u> will be written in the lab. No formula sheets permitted for the quizzes.
<u>Midterm</u> will be written in class on <u>July 30th</u> .
<u>Final</u> will be arranged by the registrar's office.

<u>Schedule for quizzes and midterm</u>

Quiz 1 July 14th
Quiz 2 July 21st
Quiz 3 July 28th
Midterm July 30th
Quiz 4 August 4th
Quiz 5 August 11th

No classes on Monday, July 26th and Monday, August 2nd . Classes end on Tuesday, August 17th

Topics Covered

(1) **Chapter 5**: Bivariate and Multivariate probability distributions, Marginal and Conditional Probability Distributions; Independent Random variables; Covariance and other expectations. The Bivariate Normal Distribution.
(2) **Chapter 6 (6.1-6.7):** Functions of Random Variables, including the method of transformation (Jacobian method) and the method of moment generating functions for more than one random variable. Order statistics and their applications.
(3) **Chapter 7 (7.2)**: Sampling distributions; the derivation fo the chi-square, t, and F distribution; Revisit the central limit theorem and derive the distribution of the sample variance.
(4) **Chapter 8 (8.1-8.4):** Estimation; unbiasedness, mean square error, evaluation of point estimators. Confidence interval estimation for the difference between two population parameters; confidence interval estimation for the population variance.
(5) **Chapter 9 (9.2, 9.3, 9.6,9.7):** Some properties of point estimators, including relative efficiency, consistency; some common method of obtaining point estimators, including the method of moments and maximum likelihood estimation.
(6) **Chapter 10:** Developing formal hypothesis tests using discrete and continuous distribution theory, Type I and Type II errors, power of a test and the Neyman-Pearson Lemma, P-values, uniformly most powerful tests, likelihood ratio test.
(7) **Chapter 11 (11.1-11.9):**Simple Linear Regression Analysis: Least squares estimation, inference for estimated coefficients, prediction, model assessment, correlation and the coefficient of determination.