

# Statistics 5.305 — Applied Probability — Winter 2004

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**Class Times:** Slot 3, 10:30–11:30, Mondays, Wednesdays and Fridays.

**Office Hours:** 11:30–12:30 Mon/Wed/ Fridays

**Text:** *Introduction to Probability Models*, 7th edition, by Sheldon Ross, published by Academic Press. ISBN 0-12-598475-8

**Topics:** The following list of topics serves only as an approximate outline and is subject to change:

( Chapter 1) Introduction to probability (counting techniques; sample spaces; general properties of probability; conditional probability; Bayes' Theorem; independence)and probability generating functions (not from the text).

( Chapters 2 and 3) Random variables (probability functions; frequently encountered discrete random variables; continuous random variables; jointly distributed random variables, independent random variables; expectation, variance and covariance; conditional probability and conditional expectation for random variables) and applications to discrete time processes.

( Chapter 4 ) Markov chains (general formulation and properties; classification of states; steady state distributions; applications).

( Chapters 5 and 6) Exponential random variables and their properties; the Poisson process; introduction to queueing theory, Continuous time Markov chains).

**Mark Distribution:** There will be five assignments and some problems will be marked. There will be two midterm tests .

Assignments ————— 10%  
Midterm Test 1 Feb.9th ————— 15%  
Midterm Test 2 March. 8th ————— 20%

Final Exam ————— 55%

Additional (ungraded) exercises will be given frequently in class. Some of the assignment questions will be taken from these. Success in this course depends strongly on the problem solving skills you will develop from doing these exercises! For the same reason, your work on assignments should essentially be an “individual effort”.

**Miscellaneous:** Consult the 2003-2004 Undergraduate Calendar for holiday and voluntary withdrawal dates, as well as information on the University’s policies on academic dishonesty (cheating, plagiarism, impersonation).