Syllabus and Problems
Mathematics 477, Mathematical Theory of Probability
Section 03, Spring Semester, 2003

Text: *A First Course in Probability by Sheldon Ross,* 6th *edition, Prentice Hall (2002).*

Lecture	Dates	Sections	Topics and Homework Problems
1	1/22	1.1-1.6	Combinatorics
		Problems:	1, 7*, 8, 12, 13, 21, 26, 27, 28*, 31, 33
		Theoretical Exercises:	2, 8, 18, 20
2	1/27	2.1-2.4	Axioms of Probability, Inclusion/Exclusion Formula
		Problems:	1, 2, 5, 8, 9, 10, 13*
		Theoretical Exercises:	1, 2, 4, 6, 7, 10, 11*, 12
3	1/29	2.5	Equally Likely Outcomes, Examples
		Problems:	14, 15*, 18, 28, 33*
4	2/3	2.5	More Examples, Stirling's Approximation for Probabilities
		Problems:	25, 27*, 37, 42, 43, 46, 47*, 51, 52, 54
5	2/5	3.1-3.3	Conditional Probability, Bayes' Theorem
		Problems:	1, 6, 8, 10*, 21, 22, 24, 32*, 39, 44, 45
6	2/10	3.4	Independent Events
		Problems:	51, 62, 67, 69*
		Theoretical Exercises:	6*
7	2/12	3.4, 3.5	Repeated Independent Trials
		Problems:	72, 73*, 74, 76*, 77
		Theoretical Exercises:	13, 15
8	2/17	4.1-4.2	Random Variables (R.V.'s), Distribution Functions, Discrete R.V.'s
		Problems:	1* ,4*, 5, 6, 7, 8
		Theoretical Exercises:	6, 7
9	2/19	4.3-4.5	Expectation and Variance of Discrete R.V.'s
		Problems:	20, 26, 27, 28*, 30, 35*, 38
		Theoretical Exercises:	9
10	2/24	Exam 1	1.1–3.5. Closed Book
11	2/26	4.6, 4.8.1-2	Bernoulli, Binomial, Geometric, Negative Binomial R.V.'s
		Problems:	33, 40, 41*, 42, 43, 49, 67, 70, 73*
12	3/3	4.7, 4.8.3	Hypergeometric, Poisson R.V.'s
		Problems:	52, 53, 56, 57*, 58, 59, 63, 76, 77*
		Theoretical Exercises:	16, 18, 20
13	3/5	5.1-5.2	Continuous R.V.'s., Expectation, Variance
		Problems:	1, 3, 4*, 5*, 6, 8
14	3/10	5.3-5.5	Uniform, Exponential, Normal R.V.'s
		Problems:	10, 12, 13*, 14, 15, 30*, 31
15	3/12	5.4.1	Normal Approximation to Binomial R.V.'s
		Problems:	22*, 23*, 26
16	3/24	5.6.1, 5.7	Gamma R.V., Functions of a R.V.
		Problems:	30*, 32, 37, 38*
		Theoretical Exercises:	12, 14, 28, 29

17	3/26	6.1	Joint Distribution of Several R.V.'s
		Problems:	1, 6, 8*, 9*, 10
18	3/31	6.2-6.3	Independent R.V.'s. and Sums of Independent R.V.'s
		Problems:	13, 15*, 18, 20*, 27
19	4/2	6.4-6.5	Conditional Distributions
		Problems:	39, 40*, 42, 43*
		Theoretical Exercises:	18, 19
20	4/7	7.1-7.2	Expectation of a Sum
		Problems:	14, 15*, 18, 23*
21	4/9	7.3	Covariance, Correlation, Variance of a Sum
		Problems:	29, 32*, 33, 34*
		Theoretical Exercises:	20
22	4/14	Exam 2	4.1–6.5. Closed Book
23	4/16	7.4	Conditional Expectation
		Problems:	44, 46*, 47, 52*
24	4/21	7.6	Moment-Generating Functions
		Problems:	71, 72, 73*
		Theoretical Exercises:	46, 49*, 50, 53
25	4/23	8.1-8.2	Markov and Chebyshev Inequalities, Weak Law of Large Numbers
		Problems:	1, 2*
		Theoretical Exercises:	1, 2*, 3
26	4/28	8.3	Central Limit Theorem
		Problems:	3*, 4, 5*, 11
		Theoretical Exercises:	8
27	4/30	8.3	Proof of Central Limit Theorem, Examples
28	5/5	Catch up and Review	

Note: This is an approximate syllabus only and because of differences in weekly schedules, some variations are to be expected.

Final Examination: , May, 4-7 PM