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).

1	Lecture	Dates	Sections	Topics and Homework Problems
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 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 Conditional Probability, Bayes' Theorem 1, 6, 8, 10*, 21, 22, 24, 32*, 39, 44, 45 Independent Events 51, 62, 67, 69* Theoretical Exercises: 6* Repeated Independent Trials Problems: 72, 73*, 74, 76*, 77 Theoretical Exercises: 72, 73*, 74, 76*, 77 Theoretical Exercises: 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: 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: 1.1-3.5. Closed Book 12 3/3 4.7, 4.8.3 Hypergeometric, Poisson 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: 10, 12, 13*, 14, 15, 30*, 31 15 3/12 5.4.1 Normal Approximation to Binomial R.V.'s Problems: 10, 12, 13*, 14, 15, 30*, 31 Normal Approximation to Binomial R.V.'s Problems: 10, 12, 13*, 14, 15, 30*, 31 Normal Approximation to Binomial R.V.'s Problems: 10, 12, 13*, 14, 15, 30*, 31 Normal Approximation to Binomial R.V.'s Problems: 22*, 23*, 26 Gamma R.V., Functions of a R.V.	1	1/22		
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Problems: 30*, 32, 37, 38*	16	3/24		
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			Theoretical Exercises:	

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
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27	4/30	8.3	Proof of Central Limit Theorem, Examples

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