

MATH 210 – Lecture 4

*Finite Mathematics*

*Semester I, 2006-2007*

***TENTATIVE*** LESSON PLAN, as of Nov. 7

Dates	Tuesday	Thursday
9/5, 9/7	1.1, 1.2	1.3, 1.4
9/12, 9/14	2.1, 2.2	2.3,2.4
9/19, 9/21	2.4,3.1	3.2
9/26, 9/28	review	exam
10/3, 10/5	3.3	3.5
10/10, 10/12	4.1	4.2
10/17, 10/19	4.3	5.1, 5.2
10/24, 10/26	review	exam
10/31, 11/2	5.3	6.1
11/7, 11/9	8.1, 8.2	8.3
11/14, 11/16	7.1	7.2
11/21, 11/23	7.3	Thanksgiving
11/28, 11/30	review	exam
12/5, 12/7	9.1	9.2
12/12, 12/14	9.3	review

First class: Sep 5 (T)

Drop Deadline: Nov 3 (F)

Last class day: Dec 15 (F)

## Overview of the Sections We Cover

1.1,1.2,1.3 : Mainly a review of high school level stuff: sets, unions, intersctions, Venn diagrams, sizes of sets. Defines some notation :  $n(A)$ ,  $A \times B$ . Some possibly tricky problems involving calculating the sizes of some boolean combinations of  $A, B, C$ , given the sizes of some other combinations.

1.4 : An introduction to Chapter 2: notion of experiment, and using trees to list all outcomes of an experiment.

2.1 : A little discussion of weights of outcomes (there's a lot more in Chapter 3), and computation of probabilities as  $\Pr[E] = n(E)/n(S)$  when all outcomes are equally likely.

2.2, 2.3 : Use of permutations and combinations in counting.

2.4 : Computing probabilities using permutations and combinations.

3.1 : Probability measures and their relation to weights. Some possibly tricky problems involving calculating the probabilites of some boolean combinations of  $A, B, C$ , given the probabilites some other combinations.

3.2 : Conditional probability and independence; computing conditional probabilities using the methods of §2.4.

3.3 : Stochastic processes and use of trees to analyze probabilities.

3.5 : Bernoulli processes: when you repeat the same experiment many times.

4.1, 4.2 : Random variables; expected value, variance, and standard deviation; computing expected values and standard deviations using the methods of §2.4.

4.3 : Continuous random variables, normal random variables, and use of the normal approximation for Bernouli processes.

5.1 : Graphs and lines in 2 dimensions.

5.2, 5.3 : Solving systems of linear equations in several variables using matrices.

6.1 : How to add and multiply matrices.

8.1 : Markov processes: relation between tree diagrams, transition diagrams, and transition matrices.

8.2 : Matrix products and Markov processes.

8.3 : Stable probabilites for regular Markov chains.

7.1 : Formulation of linear programming problems in  $n$  variables.

7.2,7.3 : Graphical solution of linear programming problems in 2 variables.

9.1 : Simple and compound interest.

9.2, 9.3 : Annuities, sinking funds, amortizing mortgages.