

# MT004-06, Fall 2011

## Finite Probability

Instructor: David Emerson      Class: MWF 12:00-12:50 in Fulton 230  
Office: Carney 364              Office Hours: Tuesday and Thursday 3:00-4:30,  
E-mail: emersodb@bc.edu              Wednesday 11:00-12:00  
Office Phone: TBA

The course MT004 is a University core course in mathematics for students in the College of Arts and Sciences, School of Education, and School of Nursing.

### Academic Integrity

As with all courses, please refer to and comply with the Universities Academic Integrity policies provided at <http://www.bc.edu/offices/stserv/academic/resources/policy.html>. These policies are important and are taken seriously at Boston College

### Course Description

**Finite Probability** is an introduction to probability and includes elements of set theory, combinatorics, and the basic concepts of finite probability and statistics. Emphasis in each of the topic areas will be placed on problem solving.

### Required Text

*Finite Mathematics and Its Applications, Second Custom Edition for Boston College* by Larry Goldstein, David Schneider, and Martha Siegel.

### Exams

There will be three 50 minute exams (in class) tentatively on October 5, November 7, and December 5. Dates for these exams will be confirmed a week in advance. For each of these exams you may prepare and use one double-sided page (8.5x11) of notes. Calculators may be used during these exams but no other electronic devices are permitted.

**Final Exam:** Monday, December 19 at 9:00 am. This date and time is **non-negotiable**. Please plan your holiday travel accordingly.

**Cheating on any exam will result in a failing grade for the course!**

### Makeup Policy

A make-up is *never guaranteed*. If you are forced to miss an exam for a legitimate reason, please inform me before the scheduled exam if this is at all possible, and otherwise as soon as it is feasible for you to do so, by phone or by e-mail. Unnecessary delay will diminish your chances of being allowed a make-up. Some form of written proof may be required from you later, such as a note sent from your Dean's office. (In some cases, a note from the infirmary may *not* be detailed enough to suffice.)

**Important:** It is *your* responsibility to see that personal travel plans, *including any plans your parents make for you*, do not conflict with exam dates. In particular, the final exam cannot be taken early.

**Devices** During class no cell phones or other electronic devices are to be used including laptops. Please ensure that your cell phones are silenced or turned off prior to the start of class.

### Homework

Unless otherwise indicated by the professor, homework should be submitted at **the beginning of class** on the day that it is due. Homework will be assigned approximately once a week to be due on

that day the following week.

### Grade

Your grade will be based on the weighted average of your exam and homework scores, according to this formula: 17% homework, 51% in-class exams (17% each) and 32% final.

While participation and attendance are not explicitly factored into your grade, they are immensely important to mastering the material. Additionally, they will be taken into consideration when making borderline final grade decisions.

### General Remarks

**Be responsible for your own learning!** This can't be stressed enough. It is up to you to find the best way to assimilate these ideas. Read the text, read your notes and think about the concepts as much as you can. It is better to study often in small doses than infrequently for long periods. And it is not enough just to sit down and do the homework problems. Do not assume I will cover everything in class, or that I will follow the presentation in the text.

### Schedule

The schedule below is a *guide* that will be adjusted as needed. Occasionally assignments below will be subject to change or modified to accommodate class content.

#### Chapter 5

Sept 7	Introduction and Expectations
Sept 9	5.1 Sets Assignment: p. 210: 13, 27 - 32, 50, 51, 57 - 60 p. 217: 6 - 8, 14, 17 - 19 p. 217: 29 - 33, 42, 46 - 48
Sept 12	5.2 Inclusion-Exclusion Principle, Venn Diagrams
Sept 14	5.2 Venn Diagrams, De Morgan's Laws
Sept 16	5.3 Venn Diagrams and Counting Assignment: p. 222: 14, 16, 22, 31, 57 - 60, 65 p. 228: 17, 19, 20, 23, 31, 35 - 37 p. 230: 39 - 41, 48, 54, 59
Sept 19	5.4 The Multiplication Principle
Sept 21	5.4 The Multiplication Principle
Sept 23	5.5 Permutations and Combinations Assignment: p. 235: 21 - 24, 28, 32, 35, 36 p. 236: 47 - 50, 56, 61, 65 p. 242: 2-4, 6, 24, 31, 36
Sept 26	5.5 Permutations and Combinations
Sept 28	5.6 Further Counting Problems

Sept 30	5.7 Binomial Theorem Assignment: p. 248: 20, 21, 25, 29, 33, 34
Oct 3	Wrap up and Review
Oct 5	Exam #1: Chapter 5 (through 5.7)
Oct 7	5.8 Multinomial Coefficient Assignment: p. 253: 9, 13, 15, 17, 21 p. 270: 1, 6, 13 - 15, 17, 22
Oct 10	No Classes
<b>Chapter 6</b>	
Oct 12	6.1, 6.2 Probability Basic Terminology
Oct 14	6.3 Assignment of Probabilities Assignment: p. 281: 1, 5, 7, 10, 16 p. 282: 15, 17, 18, 25, 26, 32 p. 288: 7, 8, 11 - 14, 27, 43
Oct 17	6.3, 6.4 Assignment of Probabilities
Oct 19	6.4 Calculating Probabilities of Events
Oct 21	6.4 The Birthday Problem and Duplication Probability Assignment: p. 299: 6, 9, 11, 15, 19, 24, 34 p. 309: 3, 5, 10 - 12
Oct 24	6.5 Conditional Probability and Independence
Oct 26	6.6 Tree Diagrams
Oct 28	6.6 Tree Diagrams Assignment: p. 310: 16 - 18, 24, 29 p. 315: 1 - 3, 5, 8, 9
Oct 31	6.7 Bayes' Theorem
Nov 2	Wrap Up and Review
<b>Chapter 7</b>	
Nov 4	7.1 Representing Data
Nov 7	Exam #2: Chapter 5 (5.8 Only), Chapter 6
Nov 9	7.2 Probability Distributions

	Assignment: p. 337: 14, 19, 23, 24 p. 347: 1, 11, 12 p. 348: 13, 17, 19, 21, 22 p. 354: 4, 6, 8, 10, 11, 13
Nov 11	7.2 Probability Distributions
Nov 14	7.3 Binomial Trials
Nov 16	7.3 Binomial Trials Assignment: p. 355: 17, 21, 24, 31, 34 p. 364: 2, 3, 5, 7, 11, 13 p. 365: 15, 16, 22, 23, 25, 29
Nov 18	7.4 The Mean
Nov 21	7.4 The Mean
Nov 23	No Classes
Nov 25	No Classes
Nov 28	7.5 Variance and Standard Deviation Assignment: p. 373: 1, 4, 5, 6, 8, 9, 11 p. 374: 12, 13, 15, 22, 25
Nov 30	7.5 Variance and Standard Deviation
Dec 2	Wrap up and Review
Dec 5	Exam #3: Chapter 7 (Through 7.5)
Dec 7	7.6 The Normal Distribution Suggested Problems: p. 387: 2, 4, 6, 8, 9, 11, 15, 18 p. 388: 19, 21, 23, 28, 34, 36
Dec 9	7.6 The Normal Distribution