

Finite Mathematics

Math 10120 Section 01

Spring 2013

General Arrangements

- **Instructor:** David Galvin, 248 Hayes-Healy, dgalvin1@nd.edu. Feel free to email me anytime. I try to respond quickly to any question or comments.
- **Office hours:** Initially
 - Thursdays, 3pm-5pm.

Also, meeting times outside my office hours can be arranged by emailing me – I have free hours most days (except Tuesdays) of most weeks.

- **Tutorials:** Twice weekly throughout the semester, there will be a (voluntary) two-hour tutorial led by Caroline Schuitema, cschuite@nd.edu. Initially these are set for
 - Wednesdays, 5pm-7pm, DeBartolo 232
 - Sundays, 5pm-7pm, DeBartolo 232.

The tutorials are a great opportunity to ask questions about anything in the course that is causing you trouble.

- **Lectures:** MWF 1.55-2.45, Nieuwland Science Hall 118, January 16 – May 1.
- **Text:** *Finite Mathematics & Its Applications* (10th Edition), by Goldstein, Schneider & Siegel, published by Pearson, ISBN-10: 0321571894, ISBN-13: 978-0321571892.
- **Course website:** http://www.nd.edu/~dgalvin1/10120/10120_S13/index.html. This is where homework, handouts and exam solutions will be posted.
- **Concourse:** <http://concourse.nd.edu/>. This is where grades will be posted.

About the course

- **Official course description:** For students in arts and letters or as an elective for students in business administration. Topics include the fundamental principles of counting systematically, probability, statistics, linear programming, optimization problems, game theory, and mathematical finance. Other topics that may be covered include population problems, difference equations and modeling, and coding information. There is a wealth of applications of these topics to contemporary social, economic, and political issues appealing to liberal arts students. Also, these topics broaden a student's mathematical horizon in an interesting direction not covered by calculus, which deals mostly with continuous models.
- **Unofficial course description/course content:** We will focus on three topics.
 - We begin with **probability**, the mathematical language that allows us to talk precisely about experiments involving chance. We will cover Chapters 5, 6 & 7 of the textbook: counting, probability and elementary statistics. We start with an exposition of some useful and efficient techniques for counting. Next we apply these techniques to the calculation of probabilities or the chances of various events occurring. Statistical inference is the final topic, where we try to make sensible inferences about a whole population, when all we have to work with is information about a small sample.

- We then move on to **optimization**, the study of what choices you should make to maximize some payoff (or minimize some payout), when various constraints are placed on the choices that you get to make. We will cover Chapters 2 & 3: linear equations and optimization. We start by examining systems of linear equations and their solutions. Matrices are introduced and we see how these can be used to solve systems of linear equations. We then look at optimization problems, which involve getting the most out of limited resources. Often such problems can be reduced to solving systems of linear equations.
- We end with some **game theory**, or the mathematics of strategy. This is Chapter 9. When you play a game with other players, you want to maximize your returns, or minimize your losses, but you have to keep in mind that your opponents also have the same objectives. We use matrices, optimization and probability to find optimal strategies for some games.

Course work

- **Homework:** Homework will be announced on the website after most lectures, and in general the homework assigned each Wednesday, Friday and Monday will be due in class the next Friday. Each assignment will involve some reading and some problems. Presented assignments should be neat and legible. At the top of the first page, you should write your name, the course number and the assignment number. If you use more than one page, you should *staple all your pages together*. The grader reserves the right to leave ungraded any assignment that is disorganized, untidy or incoherent!

Your homework assignments count (equally weighted) for 100 out of 550 points of your final mark. No late assignments will be accepted. It is permissible (and encouraged) to discuss the assignments with your colleagues; but the writing of each assignment must be done on your own.

- **Exams:** There will be three midterm exams:
 - Thursday, February 7, 8-9.15am, Nieuwland Science Hall 118,
 - Thursday March 7, 8-9.15am, Nieuwland Science Hall 118,
 - Thursday April 18, 8-9.15am, Nieuwland Science Hall 118.

The (cumulative) final will be on Thursday, May 9, from 4.15pm to 6.15pm, room TBA. Specific exam policies (such as format, which sections will be covered, . . .) will be announced in class closer to the time.

Each midterm will count for 100 points out of 550, and the final will count for 150 points out of 550. Please let me know *as soon as possible* if you have a university-sanctioned conflict with any of these exam times, so we can make arrangements.

- **Grading disputes:** If you have any issue with the grading of your weekly assignments or with your midterm exams, you must let me know (in writing; email is fine) within seven days of receiving the work back; otherwise I can't promise that I can consider the issue.

Conduct

- **Honor code:** You have all taken the Honor Code pledge, to not participate in or tolerate academic dishonesty. For this course, that means that although you may (and should) discuss assignments with your colleagues, you must write the final version of each of your assignments on your own; if you use any external sources to assist you (such as other textbooks, computer programmes, etc.), you should cite them clearly; your work on mid-semester exams and the final exam should be your own; and you will adhere to all announced exam policies.
- **Class conduct:** The lecture room should be a place where you should feel free to engage in lively discussion about the course topic; don't be shy! But non course related interruptions should be kept to a minimum. In particular, you should turn off or switch to silent all phones, etc., before the start of class. If for some good reason you need to have your phone on during class, please mention it to me in advance.