

MATH/CS 413 - INTRODUCTION TO COMBINATORICS

Spring 2022

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| Instructor: | Avery St. Dizier | Time: | MWF 1:00–1:50 |
| Email: | stdizie2@illinois.edu | Place: | 156 Henry Admin Bldg |

Instructor Statement

Conditions for the spring semester remain uncertain. This document is written under the assumption that we will be meeting in-person. I will update the course organization if we have to switch to online classes. Know that I am aware of the additional stresses of recent times. Please let me know if there are aspects of this course which are not working well for you. I hope we can all be patient with each other and listen carefully as we try to figure this out together.

Course Information

Objectives: The aim of this course is to give an introduction to finite mathematics, including enumeration, combinatorial designs, and more. We will emphasize both techniques and proofs of theorems.

Office Hours: Tentatively, my office hours will be the hour following each class. That is MWF 2-2:50pm, taking place in 165 Altgeld Hall. This time is meant for you to talk to me about anything on your mind course related or otherwise.

Resources: This class has a Canvas page, where course materials and grades will be posted.

Textbook: The text is *Introductory Combinatorics* (5th edition) by Richard Brualdi. We will aim to cover much of Chapters 1,2,3,5,6,7,8,10, plus supplemental topics. Be aware that reading, understanding, and writing proofs is an integral part of this course. I strongly encourage you to skim through the next section prior to each class.

Four Credits: It is possible to take this course for 4 credits rather than 3. If you are interested in doing this, you must email me about it very soon after the start of the course. Propose a way for you to add $\frac{1}{3}$ to your work in the class, for example a serious project of some type.

Disability Accommodations: To obtain disability-related academic adjustments/aids, students with disabilities must contact the instructor and Disability Resources and Educational Services ASAP.

Grading

Grade Breakdown: Homework (25%), Midterm exams (15% \times 3), Final exam (30%), Participation (10%)

Homework: There will be (roughly) weekly homework assignments during the semester. Your two lowest homework scores will be dropped. Homework assignments will be posted on the Canvas page, and due at 11:59pm on the due date.

Homework must be submitted electronically through the Canvas page. Homework will not be accepted after the due date for any reason (this is why the two lowest are dropped).

Collaboration and Acknowledgments: Collaboration in studying and working on homework is strongly encouraged! However, collaboration without comprehension is a waste of time. You must write up your own solutions.

You must also acknowledge any collaborations with a statement such as “I worked on problem 1 with XYZ and received help on problem 2 with ABC.” In addition, if you use books (other than the textbook) or online materials to solve the problems, you must cite their use. **Such statements will in no way affect your grade, but are a matter of academic honesty.** Failure to do so may lead to an academic integrity charge.

Exams: There will be three in-class exams. They are scheduled for **February 11th (Friday)**, **March 7th (Monday)**, and **April 15th (Friday)**. You will be allowed one hand-written index card (provided by me), but otherwise, the exams will be closed-book and closed-note, and will resemble the homework assignments.

Make-up Exams: Make-up exams will only be given to students in the event of a serious illness, accident, or family crisis together with valid documentation. You must inform the instructor as soon as you know that you are going to miss an exam to schedule a make-up. This must be done **before** the exam takes place.

Participation: I expect you to send me at least five emails during the semester with questions about material from the lectures or reading from the book (not the homework or exams). I would like these at least one week apart. The reason is that advanced mathematics students can be reluctant to publicly admit they do not understand something. Your questions to me will help me explain the material better to the whole class.

Grades: Grades will be posted online on the Canvas class page. At the end of the semester, final grades will be assigned by rounding your numeric grade to the nearest whole number and then assigning a letter grade. The grade assigned will not be lower than the following scale (but may be higher): F(0–59), D–(60–62), D(63–66), D+(67–69), C–(70–72), C(73–76), C+(77–79), B–(80–82), B(83–86), B+(87–89), A–(90–92), A(93–96), A+(97–100).

There are two exceptions to the numerical grading: anyone who takes all three midterm exams and scores $\geq 96\%$ on the Final gets an A of some kind, and anyone who scores $\geq 75\%$ on the Final will pass.