

MTH 4570/6570 and CS 4280/6280 Combinatorics and Graph Theory Fall 2023

Location Mon/Wed at 6:10–8:00 in 202M&M

Text *Introductory Combinatorics* by Richard A. Brualdi, 5th edition.

Instructor Dr. Daniel Slilaty

Office Currently in 263 M&M. Moving to 232 M&M

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Final Exam Wednesday December 13th at 5:45–7:45 in our regular classroom.

Grading Policy The approximate percentage breakdown of your grade is as follows.

Homework – 25%

3 Exams – 25% each

Your final score is calculated according to these percentages and your grade is assigned on the following scale

85–100=A

70–84.99=B

55–69.99=C

40–54.99=D

0–39.99=F

Office Hours MW 5:00–6:00 and briefly after class meetings. If you need to meet with me at some other time, then we can make an appointment.

Attendance Your attendance at all class meetings is REQUIRED. There are no excused absences for any reason whatsoever. Everyone will be given five absences without penalty. Each absence after the fifth will result in a reduction of 3 points in your final average. If you have to miss class, then you are responsible for keeping up with the material. Again, all pertinent information for the class is posted on the class webpage (not on Pilot). If for some serious reason, you need to miss an examination, let me know at least one week in advance and we will try to work something out.

Webpage Your grades will be posted on Pilot. All of the course material will be posted on my personal website.

<http://www.daniel-slilaty.xyz>

Homework Assignments Homework will be assigned on most days. It is a critical matter that you complete these assignments. If you do not complete them, it will be very difficult for you to receive a satisfactory grade in this course. If you are having trouble completing the homework, then please come to see me during my office hours for extra help. Solutions to each assignment will be posted on the course website on the due date. For this reason, no late assignments are accepted for any reason at all.

Graduate Students In addition to the above material, graduate students in Mth6570/Cs6280 will also be required to make an oral presentation (privately to me in my office or on WebEx) on a topic in algorithmic graph theory. I will present a list of several topics later in the semester, at the beginning of the graph-theory section of the course. Your presentation will be 10% of your grade. The other four items listed will actually be worth 22.5% of your final grade rather than 25% each.

Preliminary Syllabus

- Chapter – Basic Counting Principles
- Chapter – Properties of Binomial Coefficients
- Chapter – Pigeonhole Principle
- Chapter – More Advanced Usage of Mathematical Induction
- Chapter – Recurrence Relations and Generating Functions
- Chapter – Catalan Numbers
- Chapter – Difference Sequences and Stirling Numbers
- Chapter – Finite Fields
- Chapter – Balanced Block Designs
- Chapter – Magic Squares and Block Designs
- Chapter – Symmetry Groups and Polya Counting
- Chapter – Some Basic Ideas in Graph Theory
- Chapter – Trees and Algorithms on Trees
- Chapter – Planar Graphs
- Chapter – Network Flows