

MATH 442
INTRODUCTION TO COMBINATORICS II
SPRING 2008

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Office hours: To be decided upon together so as to minimize conflicts.

Textbook: *A course in combinatorics*, J.H. van Lint and R.M. Wilson, Cambridge University Press, Second edition, 2001.

Course web page: <http://www.math.cornell.edu/~rassart/Math442/>

Homework: Some problems, mostly from the book, every week or so. Those problems are notoriously hard but hints are provided at the end of the book. The hints are hard too. Collaboration is encouraged but homework has to be handed in individually.

Exams: Exams will be given in the form of take-home problem sets. No collaboration on those, obviously.

Topics: (Subject to change; I'm open to reasonable suggestions if there's something interesting you're curious about)

- Hadamard matrices and Reed-Muller codes [Chapter 18]
- Combinatorial design: Steiner systems, block designs, symmetric designs, projective planes, orthogonal Latin squares, etc. [Chapters 19 and 22]
- Combinatorial geometries: geometric lattices, matroids, general finite geometries [Chapter 23]
- Lattices, Möbius inversion on posets, applications to chromatic polynomials of graphs and arrangements of hyperplanes [Chapters 25 and 33]
- Pólya theory of counting [Chapter 37]