

Mat 598, The probabilistic method

Time: MW 3:05-4:20

Room: WCLR A 109

Instructor: Andrzej Czygrinow

Text: N. Alon, J. Spencer, *The probabilistic method*

The probabilistic method is one of the most powerful and widely used tools in graph theory and its applications in theoretical computer science. On one hand, the method often employs ingenious and surprising arguments, on the other, it uses advanced tools from modern probability theory. In this course, we will discuss some of these arguments and cover most important aspects of the method. The main part of the course will be based on the book by Alon and Spencer, but more recent results from research papers will be included as well. Among other things, we will discuss:

- Rodl's nibble method
- Lovasz local lemma
- Talagrand's inequality

The course is directed to graduate students in graph theory, combinatorics and theoretical computer science. Students will be expected to give an in-class presentation based on one of the sections of the book or a research paper.