UNDERGRADUATE SEMINAR IN COMBINATORICS

Michael Krivelevich

Fall Semester 2009

Course number: 0366-3405
When and where: Tuesdays 10-12, Schreiber 209.
Prospective audience: the seminar is intended for third year undergraduate students in Mathematics or Computer Science.
Prerequisites: first year courses in mathematics, most notably Discrete Mathematics or Introduction to Combinatorics. Working knowledge of basic graph theory notions (as provided for example by the Graph Theory course) would be very helpful.
Requirements and grade: Each participant will be assigned a topic and will deliver a lecture covering this topis; he/she will also be asked to prepare lecture notes for his/her lecture to be distributed in the class at the lecture. Participants are required to attend most of the seminar meetings. The final grade will be given based on the quality of the lecture and of the lecture notes.

Short description

The seminar will be devoted to a variety of topics in Graph Theory, that are normally not covered by our Graph Theory course due to lack of time – and certainly not due to lack of importance or attractivity. Topics covered will probably include:

- Turán theorem, Zarankiewicz problem and Kövari-Sós-Turán theorem;
- Hamiltonicity; sufficient conditions for Hamiltonicity;
- Ramsey theory; Ramsey-type statements for graphs and other objects; Ramsey numbers – upper and lower bounds;
- Coloring; chromatic polynomials, color-critical graphs, list coloring;
- Graph eigenvalues and Algebraic Graph Theory.

The seminar's aim is to acquaint its participants with attractive theorems and proofs from Graph Theory, and also to provide them with an opportunity to work independently with research books and papers.