Course Outline — Combinatorial Mathematics, Math 580, Spring 2024

Professor József Balogh, Classes are MWF: 12:00-12:50, EB 303
e-mail: jobal@illinois.edu,   **Office Hours:** After class and by appointments.
Study sessions: via: Wednesdays 2:00-3:50pm. Lincoln Hall 1066
Web page: https://sites.google.com/view/jozsefbaloghmath/teaching/math580

   Topics: This is a rigorous, graduate level introduction to combinatorics. It does not assume prior study, but requires mathematical maturity; it moves at a fast pace. The first third of the course is on enumeration. The second third covers graph theory. The remainder of the course considers some topics that are treated more in depth in advanced graduate courses (Math 581, 582, 583, 584): Ramsey theory, partially ordered sets, the probabilistic method and combinatorial designs (as time permits).
TEXTBOOK: Combinatorial Mathematics, Doug West, Cambridge U. Press, 2020.
   Test 1: Likely at: March 6 Wednesday 5-7 pm
   Test 2: Likely at: April 25 Thursday 5-7 pm
   Final Exam: Friday, May 3 1:30–4:30 p.m.,
REQUIREMENTS: Each assignment will have 6 problems, your choice of five will be graded, i.e. please submit only five solutions. Homework is usually collected on Fridays. Independently from the score: for an A, on the final test at least 50% is needed, for a B^+, at least 40%, for a C^- at least 30% is needed. For a grade B^+ or above, one has to perform well on both parts of the class, i.e. to collect at least 40% of points.
   There are 9 homework assignments, each worth 4%, two tests, each worth 16% and a final exam for 32%. The grading: 80% - : A, 75%- : A^-, 70%- :B^+, 65% - : B, 60% - : B^-, 55% - : C^+, 50% - : C, 45%- : C^- etc. Note that the writings of the solutions must have a high quality and typed, if the argument is messy or not typed then even if the solution is correct it could be returned without grading with 0 points.
   Late homework policy: In case the homework is not submitted on time, it could be submitted for the next class, with losing 10% of the score. However it might be accepted at most twice during the semester from the same student. If there is official or medical reason then try to notify me in as soon as possible via e-mail.
   PREREQUISITES: Students in the Math doctorate (Ph.D) program can register, even they may want to check if they have sufficient backgrounds and want to take Math 412 or Math 413 first. For all others, which includes MS student, Math 412 and Math 413 (or equivalent), with grades A (and not A-) needed. Computer Science or Engineer Ph.D students should contact the instructor. Please, do not try to sneak into the class, without the necessary backgrounds.
RESOURCES: Electronic mail is a medium for announcements and questions. I will use the e-mail given in the system, I am not responsible in case it is not monitored. Students are supposed to use illinois.edu e-mails, write to subject "Math 580". Grading and homework submission will be via Canvas/Gradescoop (that is likely, will be confirmed probably at the first week of classes).