

Course Outline — Combinatorial Mathematics, Math 580, Spring 2021

Professor József Balogh, Classes are MWF: 11:00-11:50, via Zoom.

e-mail: jobal@illinois.edu, **Office Hours:** After class and by appointments.

Study sessions: via ZOOM: Wednesdays 3:00-4:40pm.

Web page: <http://www.math.uiuc.edu/~jobal>. Zoom link will be announced via Moodle.

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.

CLASSES: Jan: 25, 27, 29; Feb: 1, 3, 5; 8, 10, 12; 15, 19; 22, 24, 26; March: 1, 3, 5; 8, 10, 12; 15, 17, 19; 22, , 26; 29, 31; April: 2; 5, 7, 9; 12, 14, 16; 19, 21, 23; 26, 28, 30; May: 3, 5.

Test 1: Likely at: March 18 Thursday 6-8 pm

Test 2: Likely at: April 29 Thursday 6-8 pm

Final Exam: To Be Announced by U of I.

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.

Online teaching comments: Please, try to log in at least 5 minutes early to zoom. Attending at the time of the lecture is strongly encouraged. The lectures and the notes are planned to be posted on Moodle, but in case of technical difficulties, it could be that the only proper make up possibility is reading the text book. Note that for fully understand the content, in any case, reading the text book is strongly recommended.

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. Most of the communication will be via MOODLE.