Math 431: Structures and Methods of Combinatorics
Lecture: TTh 11:10am–12:25pm, Blocker 121

Instructor: Christopher O'Neill
Office: Blocker 513G
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Office hours: Monday 1:30pm-2:30pm,
    Thursday 10:10am-11:00am,
    or by appointment

Prerequisites: Math 220 or Math 302, or approval by instructor
Final exam: Friday, December 11th, 2015, from 3:00pm–5:00pm
Text: *A Walk Through Combinatorics*, 3rd Edition, by Miklós Bóna
Course webpage: `http://www.math.tamu.edu/~coneill/teaching/f15/`

Course content: Math 431 is a course on enumerative combinatorics. As described in the course catalog, we will cover basic counting methods, generating functions, partially ordered sets, elementary graph theory, and elementary Ramsey theory. More specifically, we will cover material from Chapters 1–5, 7–13, and 16 of Bóna, plus additional topics as time permits. See the course webpage for a more detailed timeline.

Course organization: The class will be organized as follows.

- One class day each week (usually Tuesday), I will give a lecture on course material.

- The other class day each week (usually Thursday) will be a problem session and discussion.

A problem list will be distributed at the beginning of each problem session, containing the in-class work problems (which will generally introduce new material) as well as the weekly homework problems. All completed homework probems will be turned in on the following lecture day, and any in-class problems not completed during the discussion should be finished with the homework.

After each lecture day, a short list of "preliminary problems" will be assigned, and should be completed before the corresponding problem session. These assignments will be short, usually requiring at most 10 minutes to complete, and will be computational in nature (i.e. no proofs).

Although I intend to use this format throughout, I reserve the right to reformat the course as the semester progresses, based on student feedback and performance. Potential changes include (but are not limited to) the introduction of quizzes, and a restructuring of lecture and problem session schedule. I will periodically collect anonymous feedback in class, but feel free to come talk to me if you have suggestions or concerns as the course progresses.

Grading and points distribution

Participation (10%): Attendance on discussion days is vital to success in this class, since new material *will* be covered. Your participation grade will be based on the following:

- Attending and participating in lectures;

- Attending and engaging in problem sessions; and

- Completing the preliminary problems before each problem session.

Missing class will result in a lowered participation grade, and only university excused absences with *advance notice* to the instructor will be accepted. I reserve the right to deduct one *additional* full letter grade if you miss too many classes, or if sufficient participation is not demonstrated during problem sessions.

Homework (30%): There will be one homework assignment given each week, as well as a short list of preliminary problems to be completed before each problem session. Completed homework assignments will be submitted to the instructor for a grade, but preliminary problems will not be collected. Collaboration on homework is encouraged, but solutions should be written up individually, and collaborators should be identified on the front of your assignment.

Homework assignments, along with their due dates, will be posted on the course webpage as they are assigned. Out of fairness to the other students, late homework assignments will not be accepted for credit. However, the lowest homework grade of the semester will be dropped.

Research Project (Honors Section Only): Students enrolled in Section 200 of this course will also be required to complete an independent project (students in Section 500 do *not* have to complete a project). The project will be worth 10% of your final grade, replacing a portion of your homework grade. Please see me for more detail regarding expectations and possible topics.

Exams (20% each): There will be three exams throughout the semester. The exams will take place on the following dates:

- Thursday, October 1st, 11:10am–12:25pm,

- Thursday, November 5th, 11:10am–12:25pm, and

- Friday, December 11th, 3:00pm–5:00pm.

The first two exams take place during normal class time, and the last exam takes place during the final exam time. The last exam will be comparable in length to the first two exams, and most likely will not be cumulative. Please keep these dates in mind when making travel plans. Absences from exams will be excused only for university approved excuses. For more detail, consult Student Rule 7 (`http://student-rules.tamu.edu/rule07`).

Class behavior: You don't get graded on this, but please do it anyway. This involves being on time, paying attention, turning off cell phones, things like that.

Disabilities: The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services in Cain Hall, Room B118, or call 845-1637. For additional information, visit `http://disability.tamu.edu`.

Scholastic dishonesty: Copying work done by others, either in-class or out of class, is an act of scholastic dishonesty and will be prosecuted to the full extent allowed by University policy.

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An Aggie does not lie, cheat, or steal or tolerate those who do.

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Consult the aggie honor code (`http://aggiehonor.tamu.edu/`) for more detail. Collaboration on assignments, either in-class or out-of-class, is forbidden unless permission to do so is granted by your instructor.

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