Course Information for 18.204

Instructor: Mustazee Rahman  
E-mail: mustazee@mit.edu  
Office hours: M 2-4 in 2-238A or by appointment  
Lectures: MWF 1-2 in 2-135  
Course webpage: http://math.mit.edu/~mustazee/courses/18204.html

Course description

Undergraduate Seminar in Discrete Mathematics (18.204) is a communication intensive course for math majors. We will cover several topics in extremal and probabilistic combinatorics from textbooks and/or research papers. Students are generally free to choose what they want to learn so long as they get permission from the instructor. The goal of the course is to teach students to communicate as mathematicians. As such, everyone must give presentations and write terms papers on their topics of study.

Course requirements

Each student must give 3 oral presentations and write 2 papers on their topics of study. Attendance is mandatory; you risk failing the course if you miss lectures!

Presentations: Presentations start from the week of Feb 8 and continue until the end of term. The first presentation is a short 15 min talk on a simple theorem that will be assigned to you. The two remaining presentations are 40 min each. One of these must be a slide talk and the other a board talk. The topic of the longer talks may be the same as that of the written papers.

After each long talk there will be a 5 min question period for others to ask questions or provide feedback. Also, you should make a very short quiz (to be answered in 2 mins) for the audience. The quiz should be simple, for example, asking about the knowledge of the main result, a key definition or lemma.

You are encouraged to use the beamer class in Latex to create slides for the presentation. The instructor will provide guidance to anyone unfamiliar with beamer. You may use different software upon permission from the instructor.
Papers: There will be a short paper (2–5 pages) due in the middle of the term (Mar 4) and a final paper (6–10 pages) due at the end of term (May 9). The topic of the midterm paper must be approved by the instructor by Feb 15. A short proposal for the final paper is due by Mar 11. The first draft of the final paper is due on Apr 4, and during the following 2 weeks it must be peer reviewed by at least two classmates. Submit the draft to the instructor by April 20 following feedback from the review. The draft will be returned by May 2 and the final draft is due on May 9.

Both papers must be written using Latex. The instructor will provide guidance through Latex templates and examples. Susan Ruff has kindly agreed to help anyone with writing and presentations (she is the math department’s communication specialist). You may reach her through email (ruff@mit.edu); her office is in 2-370.

Recommended textbooks

Use the following textbooks to find topics of study. In order to study a topic outside of these books you must get permission from the instructor (although, this is encouraged). The instructor can provide research papers that would make for good final paper topics.

- S. Jukna, Extremal Combinatorics.

The books are available through MIT Library either electronically or in hard copy.

Grading scheme

Short presentation (5%), long presentations (35%), short paper (15%), long paper (35%), participating and quiz performance (10%). There will be no exams.

Collaboration

Collaboration with classmates is allowed but avoid working with groups far ahead of your level. You must prepare the presentations and write up the papers on your own. Plagiarism is forbidden and all sources must be referenced appropriately. Do not copy theorems or proofs directly from any source. The goal should be to express what you have understood in your own words. You may find more information from MIT’s handbook on academic integrity (https://integrity.mit.edu/).