

Designs Codes & Beyond

Discrete Maths III Seminar

Winter 2017–18

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Space-Time coordinates: Arnimallee 3, SR 119; Mondays, 10:00 – 11:30

Webpage: <http://discretemath.imp.fu-berlin.de/DMIIISem-2017-18/>

Topics of the course: In this seminar we will study a wide variety of papers. Some of these will build on topics covered during the Designs and Codes (Discrete Maths III) course, while others fall under the purview of Extremal Combinatorics.

The specific topics to be covered are Borsuk’s Conjecture, finding points in convex position, the MDS Conjecture, equiangular lines and spherical codes, Shannon capacity of graphs, rainbow matchings, and bootstrap percolation.

Literature: Relevant reading will be available from the seminar website.

Prerequisites: Familiarity with combinatorics; successful completion of Designs and Codes (Discrete Maths III) or equivalent (contact the instructor).

Requirements: If you have partners for multiple talks on a topic, you should work together closely to understand your section(s) and plan the individual talks.

Before the talks, you have to schedule **at least two** meetings with your adviser:

- The first meeting should be at least **two weeks** before your scheduled talk. By this point, you should have read and worked through the section(s) completely. The goal of this meeting is to clarify any parts of the material you do not fully understand. To this end, you should come prepared with **concrete** questions, such as, “How does line 45 follow

from lines 23 and 38 in the proof of Theorem 13.2.1?” Simply saying, “I do not understand the proof of Theorem 13.2.1” is not acceptable.

- The second meeting should be at least **one week** before your scheduled talk, and is practically a rehearsal. By this point, you should have your presentation completely prepared. If you are giving a Beamer presentation, all your slides should be completely finished - it is not okay to have any images or text missing. If you will be giving a blackboard presentation, you should have everything you plan to put on the board clearly written out, and notes on what you will be saying. The goal of this meeting is for the adviser to provide suggestions to improve the presentation (“This slide is too dense” or “Perhaps you should rearrange things here”).

It is your responsibility to arrange the meetings with your adviser. Feel free to ask for extra meetings if you would like some additional input. If you miss or come unprepared to these meetings, or if your rehearsal fails to meet the minimum standards, your talk will be cancelled and you will not earn credit for the semester.

Grading: You will be graded based on two criteria, both equally important:

- your understanding of the topic, and
- the quality of your presentation.

Successful completion of the seminar requires passing grades for both criteria.

Attendance and activity: To earn credit for the seminar, you must attend 90% of the lectures and pepper your colleagues with questions demanding clearer explanations of anything you do not understand in their talks.

The goal of the seminar is **not** to allow the speaker to repeat her or his rehearsed talk in a calm and quiet setting, but rather that we the audience learn and appreciate some nice new mathematics. Bear in mind that it is the speaker who is there to serve the audience, and not vice versa!