Undergraduate Seminar in Discrete Mathematics

MIT Course 18.304 – Spring 2013 – Thomas Rothvoß

(Incomplete) list of references

This is a list of references, informal and by no means exhaustive, for you to consult as you look for good topics for your talk. You are free to choose any topic on combinatorics that you personally like best.

- R. Diestel: "*Graph Theory*" (GTM, Springer, 4th Ed., 2010)

  Classical book on graph theory (actually the standard book). Free online version available at `http://diestel-graph-theory.com`

- N. Alon & J. Spencer: "*The probabilistic method*" (John Wiley 1992, ISBN 0-471-53588-5).

  Very good book. Shows how to solve combinatorial problems with probabilistic techniques. Degree of difficulty varies a lot from chapter to chapter (many chapters are somewhat independent).

- J. Matousek: "*Lectures on Discrete Geometry*" (GTM, Springer 2002, ISBN 0387953744).

  One of my favourite books. Very readable. Matousek is truly a master in explaining complex theorems with a minimum of calculations. Chapters are mostly independent.

- G. Ziegler: "*Lectures on Polytopes*" (GTM, Springer 1999)

  A good book for the theory of polytopes. Probably the first half (minus Chapter 4) are suitable for the seminar.

- M. Aigner & G. Ziegler: "*Proofs from the book*" (3. ed., Springer 2004, ISBN 978-3-540-40460-6, pp. I-VIII, 1-239)

  Collection of "perfect" proofs for theorems from various areas. All are nice and elegant.

- R. Stanley: "*Enumerative Combinatorics*" (Cambridge University Press, 2000)

  Usually called the "authorative reference" in the field of enumerative combinatorics. Some people say this is a bit too difficult for undergraduate level. The book is online available under `www-math.mit.edu/~rstan/ec/ec1.pdf`

- J. Fox & B. Sudakov: "*Dependent Random Choice*"

  Survey on many nice applications of the dependent random choice technique.
  Link: `http://math.mit.edu/~fox/paper-dependent-random-choice.pdf`

- Any other book, survey or original research article in discrete mathematics/combinatorics that you like.