E0 311 Jan 3:1

Topics in Combinatorics

Instructor

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Department: Computer Science and Automation

Course Time: Tue, Thu 3:30-5 pm

Lecture venue: CSA 252

Detailed Course Page:

Announcements

Brief description of the course

Teaches more advanced methods in combinatorics.

Prerequisites

A basic course in combinatorics and/or graph theory.

Syllabus

Linear Algebraic methods: Basic techniques, polynomial space method, higher incidence matrices, applications to combinatorial and geometric problems. Probabilistic Methods: Basic techniques, entropy based method, martingales, random graphs. Extremal Combinatorics: Sun flowers, intersecting families, Chains and antichains, Ramsey theory.

Course outcomes

Tools from combinatorics is used in several areas of computer science. This course aims to teach some advanced techniques and topics in combinatorics. In particular, we would like to cover probabilistic method which is not covered in the introductory course `graph theory and combinatorics'. Moreover the course would

aim to cover to some extent the linear algebraic methods used in combinatorics. We will also discuss some topics from extremal combinatorics.

Grading policy

50 percentage for exams and 50 percentage for assignments.

Assignments

Resources

L. Babai and P. Frankl: Linear algebra methods in combinatorics with applications to Geometry and Computer Science, Unpublished manuscript.

N. Alon and J. Spenser: Probabilistic Method, Wiley Inter-science publication.

Stasys Jukna: Extremal Combinatorics with applications in computer science, Springer.