Spring 2008
MATH 595 MINICOURSE
POLYTOPES AND LATTICE POINTS
AN INTRODUCTION TO HIGHER DIMENSIONS

Time: MWF 1
March 10–April 30
Place: 241 Altgeld Hall
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Prerequisites: Math 580 or consent of instructor.
The knowledge of the materials covered by the following courses is very helpful: Math 242 (Calculus of several variables), Math 403 (Eucledian geometry), Math 415 (Linear algebra), Math 417 (Abstract algebra), Math 447 (Real analysis).

Text: J. Matousek: *Lectures on Discrete Mathematics*, Graduate Text in Math., Springer 2002

Outline: The aim of this course is twofold. First, a short introduction to the basic methods of combinatorial geometry and computation by reviewing important notions, results and problems, and investigate beautiful polytopes. Second, to supply a series of research problems to interested students on or close to thesis level.

Some of the topics: We select a few chapters from the above book:
Helly, Charatheodory and Radon theorem and their generalizations.
Shelling, Upper bound theorem.
Volumes, lattice width
Geometric discrepancy.