

## Department of Statistics and Biostatistics

**Course title:** Special topics in optimization

**Course number:** 16: 960: 691

**Place;** Hill Ctr. 552

**Instructor:** Prof. Andras Prekopa,

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**Office hours:** after class or by appointment.

**Topics:** geometry of the n-dimensional Euclidean space; the problem of linear programming, history; the simplex and the lexicographic simplex methods; the dual and the lexicographic dual methods; duality theory and the theorems of Farkas, von Neumann in two-person zero-sum games; Gomory's algorithm for the solution of the integer programming problem; totally positive LP's and applications in moment and probability bounding problems, Boolean problems; solution of the transportation problem, applications in statistics; the theorems of Konig, Egervary and Kuhn's Hungarian method for the solution of the assignment problem. Elements of nonlinear programming: the Karush-Kuhn-Tucker theorem. Applications in economics and engineering design.

**Prerequisites:** Linear algebra, advanced calculus, probability theory. Students are supposed to be able to solve numerically LP's by the use of some package.

**Grading:** based on the solutions of the homework problems (five sets will be given during the semester) and the results of the exams (one midterm and one final).

**Notes:** Students will receive, right at the start of the semester the complete set of lecture notes. Other titles will be mentioned at class.