

**BASIC OPTIMIZATION
MATH 613 – FALL, 2002**

Instructor: L. Faybusovich
Text: Convexity, R. Webster

An introduction to basic structures of convex analysis is given. We start with the definition of the convex set and proceed with separation theorem, Helly, Caratheodory and Krein-Milmar theorems. We then discuss KKT optimality conditions, duality theory for the convex programming and provide an introduction to the theory of polytopes. We briefly discuss interior-point algorithms of optimization with an emphasis on semidefinite programming. Applications include but are not limited to Chebyshev approximation, game theory and elements of optimal control theory. If time permits, we will discuss convexity structures which appear in analysis and symplectic geometry.

This class can be counted towards basic requirements for the oral candidacy exam in the Mathematics Department PhD Program.