## CO 602 Fundamentals of Optimization. (Held with CM 740 and CS 795.)

**Instructor.** Jim Geelen

This course serves as a graduate level introduction to optimization, with particular emphasis on convex optimization, linear optimization, and combinatorial optimization.

**Topics**

- Linear Programming: feasibility, unboundedness, duality
- Polyhedra: extreme points, constructing polyhedra
- Solving Linear Programs: Simplex Algorithm, testing feasibility, finding extreme points, perturbation method
- Combinatorial Optimization: integer programming, total unimodularity, weighted bipartite matching, network flows
- Convex Geometry: Separating Hyperplane Theorem, duality for cones
- Convex Optimization: convex functions, normal cones and tangent cones, optimality conditions, Ellipsoid Method

**Prerequisites:**

This course has no formal prerequisites, but the material does rely heavily on linear algebra, and there is a little analysis.