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

Suggested reading:

- A. Schrijver, Theory of Integer and Linear Programming, Wiley 1998.
- V. Chvatal, Linear Programming, W.H. Freeman and Company, 1983.
- J.M. Borwein and A.S. Lewis, Convex Analysis and Nonlinear Optimization, Second Edition, Springer, 2006. (Electronic copy.)

Assessment:

- Assignements 90%
- Oral exam 10%

The oral exam will be a 15 minute exam held via Zoom and will be based only on assignment questions.