Instructor: Jozsef Solymosi,
Office: MATH 220, solymosi@math.ubc.ca

Grading: Homework assignments 40%, Take home midterm 20%, take home final 40%.

TueThu: 14:00 AM to 15:30 PM in MATX-1118

(Let me know if you refer a different schedule)

Office hours: TBA

Topics:

• Shortest paths and trees
  o Shortest paths with nonnegative lengths
  o Dijkstra’s algorithm
  o Minimum spanning trees
  o Traveling salesman’s problem

• Polytopes, polyhedra, Farkas’ lemma, and linear programming
  o Convex sets
  o Polytopes and polyhedra
  o Farkas’ lemma
  o Linear programming

• Matchings and covers in bipartite graphs
  o Matchings and covers
  o Augmenting paths
  o Koenig’s theorems

• Menger’s theorem, flows, and circulations
  o Menger’s theorem
  o Flows in networks
  o Finding a maximum flow

• Semidefinite Programming (selected topics)

Notes:
• “Understanding and Using Linear Programming” and “Approximation Algorithms and Semidefinite Programming” by
  J. Matousek and B. Gärtner, Springer. UBC library eBooks
• A. Schrijver, “A Course in Combinatorial Optimization” Schrijver
• L. Lovasz, “Semidefinite optimization” Lovasz

Further readings:
• Beating Christofides by Sitters and Stougie