

Course title: Discrete Mathematics

Course code: 63532

Professor: Gašper Fijavž

Master's program

Prerequisite knowledge:

Algorithms and Data Structures (undergraduate level)

Computational Complexity theory (time and space complexity, P, NP and NPC problems)

Programming (preferably Python)

basics of Graph Theory

basics of Computational complexity theory

Short course description:

We shall work on algorithmic problems in graph theory. Let me pin out a pair of problems that we shall keep running into: graph coloring and the problem of disjoint paths. In general, graph coloring problems are hard (in the theoretical sense). Yet if we only consider a subclass of graphs, planar graphs for example, even graph coloring problems become easy enough to work on. The problem of disjoint paths can be generalized into several directions, directed or undirected graphs, vertex- or edge- disjoint, separate terminals or not, looking for bottlenecks, maximizing flows.

Further topics will include chordal graphs, graph decompositions, matchings and vertex covers, as well as stable matchings.