

Game Theory Exam Topics, Autumn 2023

1. Combinatorial games, existence of winning / non-losing strategies, k -nim, Sprague–Grundy function, sums of games
2. Strategy stealing; Hackenbush; Erdős-Selfridge theorem and its consequences
3. Hex, Brouwer's fixed point theorem
4. Strategic games: domination, pure Nash equilibrium. Repeated games, Tit-for-Tat in repeated Prisoners Dilemma
5. Mixed Nash equilibrium, iterated elimination of dominated strategies. Proof of the Nash theorem using Brouwer's fixed point theorem; existence of symmetric Nash equilibrium
6. Maxmin strategies, von Neumann's minimax theorem on two-player 0-sum games
7. Evolutionary stability, replicator dynamics
8. Vickrey auction, Top trading cycles algorithm, group strategy-proofness
9. Stable and popular matchings in bipartite graphs; score limits in the university admission problem

Lecture notes are uploaded to the *Class Materials* folder in Teams.