Below is a brief checklist of main concepts of the course. Make sure you can make them precise. To obtain a good score at the exam, write clearly and logically, starting from definitions and correctly deducing and motivating your answers.

1 Normal form games

- pure and mixed strategies
- weak and strict domination
- iterated elimination of (weakly/strictly) dominated strategies
- rationalizability
  - iterated elimination of never-best replies
  - in 2-pl games: iterated elimination of strictly dominated pure strategies
- Nash equilibrium and refinements
  - Nash equilibrium
  - strict equilibrium
  - perfect equilibrium
    * limit of $\varepsilon$-perfect strategy profiles (mistakes w. prob. $\leq \varepsilon$)
    * perfect $\Rightarrow$ undominated; $\Leftarrow$ in 2-pl games
  - proper equilibrium
    * limit of $\varepsilon$-proper strategy profiles (costly mistakes less likely by factor $\leq \varepsilon$)
- strict equilibrium $\Rightarrow$ proper equilibrium $\Rightarrow$ perfect equilibrium $\Rightarrow$ Nash equilibrium $\Rightarrow$ rationalizable strategy profile
- In mixed extensions of finite strategic games, strict equilibria need not exist, but proper equilibria (and consequently all other variants in the chain of implications above) do.

2 Extensive form games

- pure, mixed, behavioral strategies
- perfect recall
- outcome equivalence under perfect recall
- Nash equilibrium and refinements
  - Nash equilibrium
  - subgame perfect equilibrium
  - weakly perfect Bayesian equilibrium: assessment that is weakly consistent and sequentially rational
sequential equilibrium: assessment that is consistent and sequentially rational
existence of sequential equilibria via perfect equilibria in agent normal form: extensive-form perfect equilibrium

- Relations between equilibrium strategy profiles:
  - extensive form perfect equilibrium $\Rightarrow$ sequential equilibrium $\Rightarrow$ subgame perfect equilibrium $\Rightarrow$ Nash equilibrium
  - sequential equilibrium $\Rightarrow$ weakly perfect Bayesian equilibrium $\Rightarrow$ Nash equilibrium

3 Repeated games

- stage game, perfect monitoring, discount future payoffs
- in infinitely repeated games with discounting and perfect monitoring, what payoff vectors can be supported in subgame perfect Nash equilibrium?
  - folk theorem (2 players): for sufficiently patient players (high discount factor $\delta$), any feasible and individually rational payoff vector of the stage game
  - similar result for 3/more players, provided no players have "equivalent" utility functions

4 Evolutionary stability

- robustness against small mutations
  - in a symmetric, finite, 2-pl game, a strategy $x$ is evolutionary stable if it has a higher expected payoff than any mutant strategy $y$ against a population where most people play $x$ but a small positive fraction plays the mutant strategy $y$.
  - evolutionary stability $\Rightarrow$ proper equilibrium

5 Matching

- Deferred acceptance in marriage problem
  - stable matching
  - best for men, worst for women if men propose. Other way around if women propose
  - proposing side has no incentive to lie about preferences, accepting side might
  - no rule that always picks a stable matching and where truth-telling is optimal for both sides

- Variants: college admission, roommate problem
- top trading cycles in housing problem
  - stability: no group of people can make its members better off
  - reporting true preferences optimal