Microeconomics II

1st lecture

(Online version)

Ryuichiro Ishikawa

E-mail: r.ishikawa@waseda.jp

Course outline (may be changed)

#	Date	Contents
1st	5/11	**Introduction: What is game theory and Why we study?** 7.1-7.2.1: Definition of strategic form games, and Dominant strategies
2nd	5/13	7.2.2- 7.2.3: Nash equilibrium, Incomplete information games
3rd	5/18	【Exercise Session 1】 How to solve Nash equilibrium & Bayesian Nash equilibrium
4th	5/20	7.3: Extensive form games & subgame perfect equilibrium
5th	5/25	7.3.7: Sequential equilibrium
6th	5/27	【Exercise Session 2】 How to refine Nash equilibrium
7th	6/1	**Information Economics:** 8.1: Adverse selection
8th	6/3	8.1.3: Screening
9th	6/8	8.2: Moral Hazard: Principal-Agent problem
10th	6/10	【Exercise Session 3】 How to analyze asymmetric information in game theory
11th	6/15	9.1-9.3: Auctions
12th	6/17	9.4-9.5: Mechanism design

Grading is based on your performance on assignments, exercises, and online exams.

What you study

- As a counterpart of Microeconomics I, we focus on
  "Rational decision making" *without market mechanism*.
- In recent economics, rational decisions without markets is considered in **Game Theory**, which studies *decision making under interactive situations*.
  - Then, we mainly study *game theory and its applications in economics*.
- **Textbook:** Jehle, G., & P. J. Reny, *Advanced microeconomic theory*, third ed., Prentice Hall, 2011.
  - Reference: T. Fujiwara-Greve, *Non-Cooperative Game Theory*, Springer, 2015.
  - ✓ We follow the above textbook, but the topics in the class are very common in grad. level of microeconomics. So you can choose any other related references.

What's Game Theory ?

- What's "**a game**" in game theory? :
  - An interactive situation where a person's behavior has impacts on another person's benefit/profit/payoff, etc…
  - Standard game theory considers *rational decision making* in various game situations.
- Game theory consists of:
  - *Non-cooperative games*, which does not assume cooperation among players;
  - Cooperative games, which assume cooperation among players.
  - This course focuses on non-cooperative game because it is much more popular in Economics which does not assume cooperation.
- Game theory is a mathematical framework to give a prediction(s) in such situations: The prediction is called a "*solution*" or an "*equilibrium*."

WHO CAN FIND EQUILIBRIUM IN GAMES

- Why we can obtain a "*solution*" or an "*equilibrium*" as a prediction:
  - In decision making, we can choose an action of our own accord. Each person can choose an action from different viewpoint.
  - Game theory assume an assumption or a criterion of decision making:

Rationality

- As studied in market theory, economics assumes all the people maximize their utilities/profits under constraints. That is a common postulate of rationality in economics.
- In game theory, we need to consider another rationality: *All the people can have high reasoning abilities*.