Lectures on Game Theory E309, Fall 2021

Naoki Yoshihara
University of Massachusetts Amherst
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Abstract

1 About this course:

1.1 Reading

This lecture will be based on the following text:


The following lecture note is also useful reference for you to study game theory.

Levent Kockesen and Efe A. Ok (2007): An Introduction to Game Theory

1.2 About this course: Grading

*Actual and active attendance 40%*: To show your actual and active attendance at this course, you have to submit your own summary of what you learned in each week of the course. In addition, a few quizzes may be supplied in some weeks for you to solve the answers, which should be also submitted together with your summary. The deadline of this submission is basically after one week later.

The summary of what you studied by attending the course in each week should be submitted via our Moodle page.

*Two midterm exams 20% + 20%*: The first midterm exam is on October 19 at your class time and October 14 at your class time is for your reading time (I may provide an exercise session if I can).
The second midterm exam is on November 30 at your class time and November 18 at your class time is for your reading time (I may provide an exercise session if I can).

In each midterm exam, you can bring your own hand-written notes about what you studied in this lecture. Any other thing cannot be brought into the exam.

**Final homework submission 20%** The final homework problem set will be delivered on December 7 (the final class meeting day). You have to solve all of the questions in the problem set and submit your solutions to my office by December 10 at 6pm.

## 2 Office Hours

Thursday 16:00-18:00

## 3 Syllabus

### 3.1 Contents

1. **Rational Choice under Certainty** (Sep 7-9-14-16)
   1.1. Preferences
   1.2. Preference Orderings
   1.3. Choice under certainty
   1.4. Utility


2. **Judgement under Risk and Uncertainty** (Sep 21-23-28-30)
   2.1. Fundamentals of probability theory
   2.2. Unconditional probability
   2.3. Conditional probability
   2.4. Total probability and Bayes’s rule
   2.5. Bayesian updating

Reference, Chapter 4 of Erik Angner (2016): *A Course in Behavioral Economics*, pp. 75-97

3. **Choice under Risk and Uncertainty** (Oct 5-7-12)
   3.1. Uncertainty
   3.2. Expected value and expected utility
   3.3. Attitude toward risk


4. **Game Theory as Choice under Strategic Interaction** (Oct 21-26-28, Nov 2-4)
4.1. Definition of Game Theory
4.2. Pure Strategy Nash Equilibrium
4.3. Mixed Strategy Nash Equilibrium
4.4. Subgame Perfect Nash Equilibrium

5. Applications of Game Theory to Social Sciences (Nov 9-16, Dec 2-7)
5.1. Duopoly games in imperfect market competition
5.2. Auction games
5.3. Political competition

4 Remarks

On September 2 (the 1st class meeting day), we will have a short orientation, and so the actual teaching of the contents will start from September 7. Moreover, *the class meeting on Sep 2 would be highly likely provided as an online meeting via zoom*. This is because I would have to put myself in quarantine until Sep 6, due to the requirement of CDC (Centers for Disease Control and Prevention), after my travel back from my home country to here. I will announce the final decision about the style of meeting on September 2 and invite the link to the zoom meeting if it is in online.

However, note that only possible online meeting is only Sep 2, and all of the other meetings will be face-to-face.

In all of the face-to-face class meetings, you will have a *mask mandate*. This is because UMass has adopted an indoor mask mandate for all public spaces in buildings on campus, including all classrooms.

Note also that I apply the policy to *prohibit food and drink in the classroom of all of the classmeetings*. Therefore, students will then not justify removing their masks in order to eat or drink while in class.