

PSCI/ECON 288: GAME THEORY

SPRING 2021
MW 15:25-16:40pm
ONLINE

Prof. Tasos Kalandrakis
Office: online (zoom link to be provided)
Email: kalandrakis@rochester.edu
Office Hours: T 9:00-10:00am, online.

Teaching Assistants

- Jacques Gao (Email: ang.gao@rochester.edu. Office hours: T 1:00-2:00pm, online).
- Marton Szabo (Email: szmartonbence@gmail.com. Office hours: MW 10:00-11:00am, online).

In social interaction (political, economic, or other) individual welfare depends on the choices of multiple actors. Thus, individuals must anticipate other people's behavior in order to reach best decisions. Game theory is a systematic framework for understanding and analyzing such strategic interaction.

The goal of this course is to introduce the theory of games in a systematic way. We will cover basic solution concepts for simultaneous and sequential move games, with and without complete information. Applications will be drawn from models of conflict and war, electoral competition, voting and agenda manipulation, market competition, etc.

This course follows the College credit hour policy for four-credit courses. This course meets twice weekly for three academic hours per week. The course also includes recitation for one academic hour per week.

The University of Rochester respects and welcomes students of all backgrounds and abilities. In the event you encounter any barrier(s) to full participation in this course due to the impact of disability, please contact the Office of Disability Resources. Visit <http://www.rochester.edu/college/disability/> for more information.

Lecture format:. Lectures will take place online in two primary formats:

- **Synchronous lectures:** Most lectures will take place synchronously over the Zoom platform (link to be provided over blackboard). While these sessions will be recorded for subsequent distribution, you are expected to attend the live version (unless there exist extenuating circumstances). A key benefit of attending live lectures is the opportunity to ask questions, follow up on other classmates' questions, and participate in discussion. Obviously, none of the above can happen if you only watch an already recorded version.
- **Reverse lectures:** During these 'reverse' lectures a pre-recorded portion of the lecture will be posted online ahead of time. You will be expected to watch this portion prior to joining a live online zoom session at a specified time typically halfway into what would have been a synchronous lecture, during which I will be answering questions on materials covered in the pre-recorded portion and/or go over additional examples.

In all cases, PDF copies of lecture slides will be distributed ahead of time via blackboard. Live recordings of synchronous lectures as well as the live portion of reverse lectures will be made available later, typically by the evening of the same day.

Reading: The main textbook for the course is

- An Introduction to Game Theory, by Martin Osborne (Oxford).

Lectures will be based on – but not limited to – materials from this book. Other optional textbooks you may wish to consult for a different perspective, additional examples, and generally to deepen your understanding are,

- Strategy, by Joel Watson,
- Games, Strategies, and Decision Making, by Joseph Harrington, and
- Strategies and Games, by Prajit Dutta.

Finally,

- Thinking Strategically, by A. Dixit and B. Nalebuff,

is informal yet informative.

Homework Assignments: Game theory cannot be mastered without working through homework assignments. Problem sets will be assigned on a weekly or bi-weekly basis and will be due *in class* right before lecture. Assignments will be posted on blackboard roughly a week before the due date, as detailed in the following schedule:

- Assignment 1 – post February 3; due February 10.
- Assignment 2 – post February 10; due February 17.
- Assignment 3 – post February 17; due February 24.
- Assignment 4 – post March 10; due March 17.
- Assignment 5 – post March 17; due March 24.
- Assignment 6 – post March 24; due March 31.
- Assignment 7 – post April 7; due April 14.
- Assignment 8 – post April 14; due April 21.
- Assignment 9 – post April 21; due April 28.
- Assignment 10 – post April 28; due May 5.

Please check the course pages on blackboard regularly for up to date information on assignment due dates, etc. *No late homework will be accepted.* Instead, you can drop two assignments in calculating the homework component of your final grade.

Academic honesty: General University policies and guidelines regarding academic honesty apply with the following added clarifications. First, with regard to homework assignments, we expect and even encourage students discussing and jointly working on assignment problems, *yet* you are individually responsible and must prepare and write up submitted answers on your own. Second, **course materials including lecture notes, assignments, assignment answer keys, and exams are proprietary and are not intended for sharing outside the classroom, certainly not for**

dissemination in the public domain through electronic media. *You may not make such materials available to any third person or entity within or outside the University without my explicit written consent.*

Recitation: Recitations will be offered on Mondays prior to each assignment (all assignment due dates are Wednesdays by the beginning of class). Recitations will take place online through zoom (links will be provided through blackboard). There will be *no* recitation on:

- Monday, March 1.
- Monday, April 5.

Evaluation: Your grade will be based on homework assignments (10%), the first midterm (27.5%), the second midterm (22.5%), and a non-cumulative final (40%). *There will be no provisions for extra credit.*

Exam Dates: Both midterms will take place by default during scheduled class times, the first on Monday, March 1st, and the second on Monday, April 5. The final exam is scheduled for Monday, May 10, at 8:30am.

Schedule: Below is an outline of the main topics of the course.

TOPIC 1 STRATEGIC FORM GAMES

Weeks 1-4. Overview. Dominated strategies. Iterated Elimination. Nash equilibrium in pure and mixed strategies.

TOPIC 2 EXTENSIVE FORM GAMES

Weeks 5-9. Strategies. Subgame perfect Nash equilibrium. Backwards Induction. Bargaining.

TOPIC 3 GAMES OF IMPERFECT INFORMATION

Weeks 9-10. Information sets. Extensive and strategic form.

TOPIC 4 REPEATED GAMES

Weeks 11. Repeated games. Folk Theorems.

TOPIC 5 STATIC GAMES OF INCOMPLETE INFORMATION

Weeks 12. Bayesian games.

TOPIC 6 DYNAMIC GAMES OF INCOMPLETE INFORMATION

Weeks 13-14. Dynamic games of incomplete information. Sequential equilibrium. Signaling games.