

## PSC/ECO 288: GAME THEORY

SPRING 2020  
MW 15:25-16:40pm  
MELIORA 203

Prof. Tasos Kalandrakis  
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Office Hours: T 9:00-10:00am

### Teaching Assistants

- Jae Eun Kim (Email: [jaeunkim21@gmail.com](mailto:jaeunkim21@gmail.com). Office hours: W 10:00-11:30am, Harkness 309).
- Thomas McCauley (Email: [tmccaul3@ur.rochester.edu](mailto:tmccaul3@ur.rochester.edu). Office hours: M 10:00-11:30am, Harkness 305).
- Gyu Sang Shim (Email: [gshim2@ur.rochester.edu](mailto:gshim2@ur.rochester.edu). Office hours: T 11:00am-12:00 noon, T 3:00-4:00pm, Harkness 109A).

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.*

**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 January 22; due January 29.
- Assignment 2 – post January 29; due February 5.
- Assignment 3 – post February 5; due February 12.
- Assignment 4 – post February 12; due February 19.
- Assignment 5 – post February 19; due March 5.

- Assignment 6 – post March 5; due March 18.
- Assignment 7 – post March 30; due April 8.
- Assignment 8 – post April 8; due April 15.
- Assignment 9 – post April 15; due April 22.
- Assignment 10 – post April 22; due April 29.

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.***

**Recitation:** Recitations will be offered on Mondays prior to each assignment (all assignment due dates are Wednesdays at the beginning of class) and/or prior to each midterm exam. Recitations will take place in Morey 321 from 4:50pm to 6:05pm. There will be no recitation on:

- March 30.

**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 in class, the first on Wednesday, February 26, and the second on Wednesday, March 25. The final exam is scheduled for Monday, May 4, at 8:30am.

**Course conduct & Electronics policy:** The use of computers, laptops, i-pads, cell-phones or similar devices during lectures is prohibited, unless note-taking software accommodation is arranged ahead of time and a formal notification is received from the accommodation office. Copies of lecture slides will be posted online ahead of time for anyone who wishes to print a hard copy on which to take side notes during lecture. Common courtesy is expected which includes, for instance, avoiding entering or exiting the classroom in the middle of lecture. If you do not plan on attending the full lecture please give prior notice of your early departure or skip class altogether.

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

#### TOPIC 1 STRATEGIC FORM GAMES

Weeks 1-5. Overview. Dominated strategies. Iterated Elimination. Nash equilibrium in pure and mixed strategies.

#### TOPIC 2 EXTENSIVE FORM GAMES

Weeks 6-9. Strategies. Subgame perfect Nash equilibrium. Backwards Induction. Bargaining.

#### TOPIC 3 GAMES OF IMPERFECT INFORMATION

Weeks 10-11. Information sets. Extensive and strategic form.

#### TOPIC 4 REPEATED GAMES

Weeks 11-12. Repeated games. Folk Theorems.

#### TOPIC 5 STATIC GAMES OF INCOMPLETE INFORMATION

Weeks 12-13. Bayesian games.

#### TOPIC 6 DYNAMIC GAMES OF INCOMPLETE INFORMATION

Weeks 13-15. Dynamic games of incomplete information. Sequential equilibrium. Signaling games.