



Brown University

**ECON 1090 – Introduction to Game Theory**  
Spring 2020 (Updated 04/02)

**Professor:** Geoffroy de Clippel ([declippel@brown.edu](mailto:declippel@brown.edu))

Asynchronous teaching (see videos and other content posted on canvas)

+ Q&A Zoom sessions (click on zoom link on canvas website) on Wednesdays @ 9am (until 9:50am or when there are no more questions)

OH: Thursdays 8:15-10am (go to virtual wait room at <https://brown.zoom.us/my/declippel>)

**Teaching Assistants:**

Ricardo Fonseca, [ricardo\\_fonseca@brown.edu](mailto:ricardo_fonseca@brown.edu)

Marcela Mello Silva, [marcela\\_mello\\_silva@brown.edu](mailto:marcela_mello_silva@brown.edu)

Sections meet on Mondays 1-2pm (Ricardo, [via Zoom](#)), and Tuesdays 4-5pm (Marcela, [via Zoom](#)). You need to attend only one section per week (but can attend multiple ones if that helps), so you choose which fits your schedule best. Sections start January 31.

Office hours [via Zoom](#): Mondays 2:15-3:15 pm (Ricardo), Tuesdays 1:15-2:15 pm (alternating TAs), and Wednesdays 10:00-11:00 am (Marcela). Office hours start January 27.

**Overview:** This course offers an introduction to game theory, which studies *strategic interactive decision-making*.

Upon successful completion of the course, students will

- Have experienced thinking like an economist (reasoning through models),
- Recognize key strategic variables in interactive decision-making, and gain the ability to communicate them effectively to others,
- Understand the tension that exists between individual and collective incentives, and ways to mitigate it,
- Appreciate the role of information in strategic thinking,
- Better understand behavior in key applications covering business, economics, political science among others,
- Master central solution concepts in game theory, with a critical understanding of their meaning and limitations

Time permitting, the course will cover a variety of key concepts including preference, utility, beliefs/probability, expected utility, strategic-form games, dominant strategy, iterated elimination of dominated strategies, common knowledge, Nash equilibrium, pure/mixed strategy, zero-sum games, extensive-form games, perfect vs. imperfect information, complete vs. incomplete information, action and strategies, backward induction, subgame-perfect Nash equilibrium, Pareto efficiency, repeated games, auctions, moral hazard, evolutionary game theory, cooperative games (the core), and behavioral game theory. The objective is to give students a broad understanding of strategic thinking. Accordingly, there will be an emphasis

on examples to illustrate these different ideas and concepts, while a more in-depth analysis can be pursued in subsequent courses.

**Sections:** will be devoted to answering questions about the theory and discussing exercises similar to those of the upcoming homework. Use office hours or schedule an appointment to clarify previous homework assignments.

**Prerequisites:** Math 0090 (or equivalent) is the only prerequisite. Yet this is an advanced class in economics, and indeed counts as a 1000-level class for all econ concentrations. At most one ECON course in the 1000-1100 range can fulfill the 1000-level requirement in econ majors. The absence of pre-requisites simply reflects the fact that this course can be taught at the advanced econ level without previous knowledge of intermediate microeconomics. *It does not mean that the class is easy. Your willingness to work hard is essential for a good understanding of the subject, and succeeding in this course.*

**Textbook:** There are multiple textbook on game theory, but none that adequately matches the format of this course. Students are responsible for taking notes. I will provide supporting notes or videos, and references as we cover the material.

**Course website:** All material is available through canvas.

**Grading:** Your numerical grade in the course will be determined as a weighted average of your participation/class attendance, weekly assignments, and exams (midterm+final). The weights are:

Weekly assignments: 20%  
Midterm exam: 25%  
Participation/Class Attendance 10%  
Final exam 45%

I will take into account the absolute value of this numerical grade, as well as its relative position in the overall distribution, to decide on the final letter grade for the course. Following the economics department guidelines, I usually don't expect there will be more than 50% of As. **Given the exceptional circumstances (in particular a different format for the final exam), I will consider the possibility of granting more than 50% of A's if multiple students fall very near but below the median.**

Students who wish to audit the class will have to submit weekly assignments and pass the participation/class attendance requirement.

**Participation/Class Attendance:** There will be a few quizzes throughout the semester to get an idea of how students might make choices in different circumstances. There is no right or wrong answers in those quizzes, and thus they are not graded. However, students' participation will be factored in the participation/class attendance grade (see next paragraph).

Class attendance to main lectures and sections is **mandatory**. Attendance will be checked four times during the semester. Participation/class attendance counts for 10% of the final grade. You get full credit if you participated to all but at most one quizzes on time, and were in class at least 3 out of the 4 times attendance was checked. **Adjustment for online transition due to**

**covid-19:** we checked class attendance twice before the spring break. Class attendance was going to be checked another two times afterwards. Instead, there will be two canvas discussions and participation in those discussions will count as class attendance. Nothing else changes aside from this. You get half credit (5% out of 10% of the final grade) if you participated to a majority of quizzes and were in class at least 2 out of 4 times attendance was checked. Otherwise you get no credit for this part of the final grade.

**Weekly assignments:** Problem sets are made available on the class website on Wednesdays at 4pm. On weeks where a problem set is due, please ~~place your solution set in the designated box in the basement of Robinson hall~~ submit your solution set on canvas by Wednesday 4pm at the latest. On rare occasions, justified delays of a couple of days can be accommodated. This will be decided by the TA on a case by case basis. Motivated requests must be submitted *\*before\** the assignment's deadline. In all other circumstances, missing a deadline means a zero score.

*\*\*Always make a copy of your solution sets before dropping them in the box\*\* (needed in the rare circumstance the solution set gets misplaced...)*

~~Graded assignments will be available in a box in the basement of Robinson hall.~~ TAs will use canvas for grading assignments. Answer keys will be posted on the canvas website.

The TA or a grader will grade problem sets. Any question regarding the grading of a problem set **must be submitted to the TA within two weeks of it being returned**. Re-grade requests must be submitted in writing (by email), with a note explaining the reason why the question should be regraded.

Students are not allowed to submit joint solution sets. Although students are free to discuss problem sets with each other, they are expected to solve them independently in order to best prepare for the exams, which will be comparable in difficulty to the problem sets.

**80-min Midterm Exam:** The midterm exam will take place on March 11 in place of the regular class. **\*\*No alternative date will be arranged.\*\*** Details regarding the content and format of the exam will be provided a week before the test.

**Final exam:** The final exam will cover the entire material, and will last at most two hours and a half. ~~Please be aware that the course falls in the examination group number 02, and hence the final exam will be held on May 14 at 2pm. \*\*No alternative date will be arranged.\*\* Students will not be allowed to consult any material during the exam.~~ The final exam will be an open-book take-home exam with no set time limit, except for having to submit answers within 72 hours of the start date of May 6. (This does not mean that the test will be so long that it requires 72 hours to complete. It will be a test of standard length, but with the flexibility of doing it at the most convenient time in a 3-day period.)

The TAs will grade the midterm and the final, under my supervision. Students then have at most two weeks to introduce a complaint regarding a grade after exams have been graded. The TAs deal with complaints, and will refer to me if needed. Requests must be ~~placed in the TA's mailbox situated in the basement of Robinson hall~~ e-mailed to TAs. They must be specific and motivated. This means that you must include a copy of the question(s) that need(s) to be re-

graded, a copy of the answer(s), and an explanation as to why the question(s) need(s) to be re-graded.

**Expectations of Time Spent:** Attendance to class (32.5 hours total), attendance to TA sections (12 hours), solving problem sets, answering quizzes and reading material (expected to take an equivalent of 7 hours per week on average, or 91 hours in total), 2.5-hour final exam, preparing for the midterm and final exams (expected to take 45 hours). The total number of hours is thus: 183 hours.

**Please review the Brown University Academic Code**, available at

<http://www.brown.edu/academics/college/degree/sites/brown.edu/academics/college/degree/files/uploads/Academic-Code.pdf>

Violations of the Academic Code will lead to strict disciplinary action as outlined in the Code. Misunderstanding of the Code will not be accepted as an excuse for dishonest work.

**Accessibility and Accommodations:** Brown University is committed to full inclusion of all students. Please inform me early in the term if you have a disability or other conditions that might require accommodations or modification of any of these course procedures. You may speak with me after class or during office hours. For more information, please contact [Student and Employee Accessibility Services](#) at 401-863-9588 or [SEAS@brown.edu](mailto:SEAS@brown.edu).