



Faculty of Liberal Arts and Professional Studies
Department of Economics
Econ 6100: Topics in Microeconomic Theory
Winter 2025

Class Information:

- Time and location: Winter 2025, Thursday 2:30-5:30 pm, Classroom VH 1020
- Course Webpage: <https://eclass.yorku.ca/course>
- Prerequisite: Economics 5100 3.0

Course Description

This course serves as a graduate-level introduction to game theory and its applications, specifically tailored for first-year Economics Ph.D. students. Throughout the curriculum, we will delve into core concepts of game theory, encompassing static and dynamic games of complete information, games of incomplete information, repeated games, and more.

The latter part of the course will extend beyond theoretical foundations to explore applied topics, including bargaining, information economics, and mechanism design. To maximize your understanding and engagement with the material, a robust background in mathematics is required. Proficiency in advanced calculus, probability theory, basic measure theory, and various methods of mathematical proof will be beneficial for navigating the course content.

Instructor: Yishu Zeng

- E-mail address: zengyish@yorku.ca
- Office Hour: By appointment

Note: Please kindly indicate “Econ 6100” in the subject of your email.

Lectures

During the lectures, I will primarily use an iPad to write notes. After each class, I will share everything I write as a PDF file on eClass. I encourage you to take additional notes on any points I discuss or that we talk about in class that you find useful, as this will help you stay focused. The last hour of each session will be devoted to solving practice problems to develop problem-solving skills.

The lectures will focus on building a strong understanding of the concepts rather than solely preparing for exams. This means the course materials alone may not be sufficient for exam preparation. Success in tests will depend heavily on self-study. I have listed multiple standard textbooks below for your reference. Additionally, studying in groups can be beneficial, especially for those who have not taken a game theory class before.

While attending in-person lectures is not mandatory, I highly encourage you to actively participate in classes by asking and answering questions and contributing to discussions, as this can significantly enhance your learning experience. Active class participation (should not be confused with attendance) will be rewarded as a bonus up to 10 points.

Please avoid causing any disruptions during ongoing discussions if you choose to enter or exit the classroom and note that you are free to do so at any time. Mobile phones are strictly prohibited during lectures to maintain a constructive learning environment. Violators of these rules will be penalized by the deduction of bonus points. Tablets or laptops are allowed only for note-taking purposes.

Textbooks

This course does not have any required textbooks. If you want to refer to some textbooks for the materials we cover, the main references will be the following two:

- Microeconomic Theory; By Andreu Mas-Colell, Michael D. Whinston, and Jerry R. Green; Oxford University Press, 1995 (**MWG**).
- Modeling Strategic Behavior: A Graduate Introduction to Game Theory and Mechanism Design; By George J. Mailath; World Scientific Lecture Notes in Economics and Policy. February 2019 (**M**).

You are also encouraged to read other excellent textbooks listed below:

- **Suggested, less advanced:** Strategy: An Introduction to Game Theory, 3rd. Edition; By Joel Watson; W. W. Norton, 2013 (**Watson**).
- **Suggested, more advanced:** (1) A Course in Game Theory; By Martin Osborne and Ariel Rubinstein; MIT Press, 1994 (**OR**). This textbook is available as a free PDF download at <http://www.economics.utoronto.ca/osborne/cgt/index.html>. (2) Game Theory; By Drew Fudenberg & Jean Tirole; MIT Press, 1998 (**FT**).

Homework Problems and In-Class Quizzes

We will have five to six sets of homework problems, spaced approximately every two weeks. Additionally, you can expect two in-class quizzes, one before the midterm exam and one before the final exam. These quizzes are open-book, and each takes an equal weight of the total quiz scores.

Submission & Expectations: Please upload your work, including the homework and quizzes, electronically on eClass. Make sure that your submission is readable. Please give rigorous and complete answers. Explain all required steps of your argument, and do not leave out calculations even if the math in your opinion is trivial. This expectation also applies to your write-up solution for all the exams.

Exams and Grades

The average score of all homework problem sets will contribute 15% to the final grade. In-class quizzes will account for 15%. Additionally, there will be a midterm exam and a final exam, which will contribute 30% and 40% to your final grade, respectively. Please refer to the specific dates below. The final exam will take place during the official final exam period. **Extra credit and additional work will not be offered, and grades are non-negotiable.**

You must provide an acceptable reason within 72 hours if you miss any test. If your excuse is deemed acceptable, a make-up exam will be held on the same day as your final exam. The make-up exam may include all the materials covered in the course. Your letter grade will be calculated according to the following scheme:

Range	Grade
100 – 90	A+
90 – 85	A
85 – 80	A-
80 – 70	B+
70 – 55	B
55 – 45	C
45 – 0	F

Important dates:

Quiz 1: Jan 30th, 2025 (In Class)

Midterm: Feb 27th, 2025 (In Class)

Quiz 2: Mar 27, 2025 (In Class)

Final: TBA

Tentative Course Outline

I listed all the topics that will be covered in this course. The order of going through all the topics in this list may not be followed strictly.

- Static Games
 - Games in Normal Form
 - Strictly and Weakly Dominated Strategies
 - Iterated Deletion of Dominated Strategies and Rationalizability
 - Nash equilibrium
 - Games of Incomplete Information
 - Bayesian Nash Equilibrium
- Dynamic Games with Complete Information
 - Games in Extensive Form
 - Subgame perfect equilibrium
 - Repeated Games
 - * One-shot deviation principle
 - * Folk theorem
 - Noncooperative Bargaining
- Dynamic Games with Incomplete Information
 - Sequential rationality, perfect Bayesian equilibria, and sequential equilibria
 - Signaling games and equilibrium refinements
 - Applications: cheap talk, reputation, bargaining, social learning, etc.
- Information Economics
 - Signaling and screening
 - Moral hazard: The principal-agent problem
- Mechanism Design
 - The revelation principle

- Quasilinear utilities and VCG mechanisms
- Dominant Strategy Mechanisms
- Bayesian Incentive Compatible Mechanisms
- Optimal auction design
- Bilateral trading and the Myerson–Satterthwaite impossibility theorem