

## ECO316 H1S: Applied Game Theory

Department of Economics

University of Toronto

Summer 2019

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**Lectures:** Tues and Thurs 12pm - 2pm at LM158

**Tutorials:** Tues and Thurs 2pm - 3pm at LM158

**Office Hours:** Tues 3pm – 4pm at GE254

**TA Office Hours:** Thurs 3pm – 5pm at GE213

### 1. Course Description

Game theory is an aspect of economics that studies decision makers' choices (i.e. consumers, firms, and governments) when their payoffs depend on others' actions. This course aims to provide an introduction to game theory and with particular emphasis on its application to economics. We will learn some core concepts of game theory and use them to explain economic, social, and political phenomena. By the end of course, you will be able to

- Identify and classify the types of games
- Use appropriate tools to solve different forms of games
- Follow logical arguments and apply the strategic reasoning to analyze real life examples

### 2. Course Website

We will post lecture slides, problem sets and solutions on **Quercus** and also use it to make announcements. Please check it regularly.

### 3. Prerequisites

ECO200Y1/ECO204Y1/ECO206Y1

This course also requires basic calculus and probability theory. For instance, integration, derivative, and probability distribution. It would be better that you review these materials before you attend the lecture.

You are reminded that you can take only one (NOT both) of ECO316 and ECO326.

- ECO316 and ECO326 are exclusions for each other – that means you cannot take both courses towards your degree.
- ECO316 cannot be counted towards any program that requires ECO326. In other words, if you need to take ECO326 for your program, you cannot take ECO316.
- The Department of Economics will not remove students from courses that are exclusions. However, when the time comes to graduate and courses are counted, the rules will be enforced, and exclusions will not count toward the degree or program. Students are expected to comply with the rules of the calendar when they choose their courses.

More information about the two courses is available at:

- [http://www.artsandscience.utoronto.ca/ofr/calendar/crs\\_eco.htm#ECO316H1](http://www.artsandscience.utoronto.ca/ofr/calendar/crs_eco.htm#ECO316H1)
- [http://www.artsandscience.utoronto.ca/ofr/calendar/crs\\_eco.htm#ECO326H1](http://www.artsandscience.utoronto.ca/ofr/calendar/crs_eco.htm#ECO326H1)

#### 4. Textbook:

*An Introduction to Game Theory* by Martin J. Osborne (Oxford University Press, New York, 2003), ISBN-13: 978-0195128956

#### 5. Evaluation:

Your final grade will depend on **participation** (10%), one **Midterm Test** (35%) and one **Final Exam** (55%). However, if your midterm grade is higher than your final, both exams take 45% of final grade.

The Midterm Test would be **2 hours**, written on **July 13, in class**.

Final Exam is a **3-hour** exam during university exam period. The specific date will be announced later in the term.

#### 6. Problem Sets and Tutorials

We will post problem sets on Quercus and our TA En Hua will cover it during the tutorials. Only part of solutions would be post online, so make sure that you attend tutorials to learn the materials. The problem sets are not graded but they would for sure benefit your exam a lot.

#### 7. Make-up Exams

**No calculators or any other aids will be permitted in the midterm exam or in the final exam.**

If you miss the midterm exam because of a serious illness, you need to obtain a fully completed University of Toronto “Verification of Student Illness or Injury” Certificate, available at <http://www.illnessverification.utoronto.ca/>. We will not accept any other form.

Here are the rules:

1. You need to see the doctor before the exam. I will not accept certificates that relate to visits after the exam.
2. The illness must be serious enough that you are unable to write the exam. It is not enough that, given the illness, you would not do as well as you otherwise might. I will not accept certificates concerning minor ailments.
3. The certificate must be completed by a qualified medical doctor (not, for example, a chiropractor, acupuncturist, or other medical professional).
4. The certificate must include the doctor’s OHIP registration number.
5. The certificate must be completed in full and must be completely legible. In particular, I will not accept a certificate unless the doctor’s name, licensing body, and registration number are legible.
6. You must email me the day of the exam, explaining the circumstances.
7. You must bring me the original certificate (not a scan or copy) in person as soon as you are better. I will not accept emailed certificates.
8. You must write the makeup exam. If you do not write the makeup exam, you will receive 0 for the midterm. (There will be no makeup for the makeup.)

## **8. Re-grading**

You can submit re-grading request if you find your test is mis-graded. Please make sure you submit the request in one week after you receive the test. You are eligible for re-grading only if you write the test by pen. If you write it by pencil, you cannot get re-grade. Moreover, the re-grade is based on entire exam, not only one particular question, so your grade may be lower after re-grade.

## **9. Religious Accommodation**

As a student at the University of Toronto, you are part of a diverse community that welcomes and includes students and faculty from a wide range of backgrounds, cultural traditions, and spiritual beliefs. For my part, I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. Further to University Policy, if you anticipate being absent from class or missing a major course activity (like a test, or in-class assignment) due to a religious observance, please let me know as early in the course as possible, and with sufficient notice (at least two to three weeks), so that we can work together to make alternate arrangements.

## **10. Learning Disability Accommodation Requirement**

Students with diverse learning styles and needs are welcome in this course. If you have an acute or ongoing disability issue or accommodation need, you should register with Accessibility Services (AS)

([accessibility.utoronto.ca](http://accessibility.utoronto.ca)) at the beginning of the academic year. Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs. AS will assess your medical situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your condition with any instructor, and your instructors will not reveal that you are registered with AS.

## 11. Academic Integrity

All students, faculty and staff are expected to follow the University's guidelines and policies on academic integrity. For students, this means following the standards of academic honesty when writing assignments, collaborating with fellow students, and writing tests and exams. Ensure that the work you submit for grading represents your own honest efforts. Plagiarism—representing someone else's work as your own or submitting work that you have previously submitted for marks in another class or program—is a serious offence that can result in sanctions. Speak to me or your TA for advice on anything that you find unclear. To learn more about how to cite and use source material appropriately and for other writing support, see the U of T writing support website at [www.writing.utoronto.ca/](http://www.writing.utoronto.ca/). Consult the Code of Behaviour on Academic Matters for a complete outline of the University's policy and expectations. For more information, please see <http://www.artsci.utoronto.ca/osai> and <http://academicintegrity.utoronto.ca/>.

## 12. Tentative Schedule

Week 1	July 2	Strategic games and Nash equilibrium (Ch 1 and 2.1-2.7)
	July 4	Best response and firm competition (Ch 2.8, 3.1-3.2)
Week 2	July 9	Hotelling's model and electoral competition (Ch 3.3)
	July 11	Mixed strategy Nash equilibrium (Ch 4.1-4.3, 4.5)
Week 3	July 16	Expert diagnosis and Volunteer's dilemma (Ch 4.6, 4.8)
	July 18	Rationality and strict dominance (Ch 2.9)
Week 4	July 23	<b>Midterm Test</b>
	July 25	Games with imperfect information and auctions (Ch 9)
Week 5	July 30	Extensive games and subgame perfect equilibrium (Ch 5.1-5.5)
	August 1	Stackelberg duopoly and ultimatum game (Ch 6.1-6.2)
Week 6	August 6	Repeated games and collusion (Ch 14.1-14.2)
	August 8	Extensive games with imperfect information (Ch 10.1-10.7)