CO 456   **Game Theory**   **Fall 2012**

Instructor: Zachary Friggstad   **Office:** DC 3140
E-mail: zfriggstad@math.uwaterloo.ca   **Extension:** 37811

Lecture: MWF 12:30 am - 1:20 pm, MC 2035

Office Hours: Monday, Tuesday, Friday 1:30 - 2:30 pm
(or e-mail for an appointment)

TA Office Hours:

Sara Ahmadian	Tuesday 4:00 - 5:00 pm	MC 5172
Hadi Minooei	Wednesday 3:00 - 4:00 pm	MC 5041

Course Material: We will primarily use An Introduction to Game Theory by Martin J. Osborne, especially in the first half of the class. This text is available in the book store.

Later in the semester, quite a few course notes will be taken from Algorithmic Game Theory by Noam Nisan, Tim Roughgarden, Éva Tardos, and Vijay V. Vazirani. A free copy is available online at
http://www.cambridge.org/journals/nisan/
Use login agt1user and password camb2agt.

Another good text is Multiagent Systems: Algorithmic, Game-Theoretic, and Logical Foundations by Yoav Shoham and Kevin Leyton-Brown, available at http://www.masfoundations.org/download.html. The presentation level is more advanced than Osborne's book, but it might be useful as an alternative reference.

Supplementary course notes will be posted on Waterloo LEARN at http://learn.uwaterloo.ca

Grades: 6 Assignments: 2.5% each, Project: 5%, Midterm: 35%, Final Exam: 45%

Midterm: Wednesday, October 17, 6:30 pm - 7:50 pm, MC 2017

Course Website: The course website will be hosted on Waterloo LEARN. Students are responsible for checking the course page regularly for any relevant course information or announcements.

Concepts: Topics will be selected from the following list, but we do not have enough time to cover all.

- Strategic games and Nash equilibrium (a large portion of the class)
- Extensive games: games with multiple stages
- Coalition games: incorporating some cooperation
- Bayesian games: dealing with imperfect information
- Computing mixed Nash equilibrium
- Auctions and mechanism design
- Price of anarchy
- Bargaining
- etc.

Project: The project may be completed individually or in groups of two. There will be two options for the project. Both include analyzing a game, one involves implementing some strategies in Java and having these implementations participate in a tournament, and the other involves reading up on a topic not covered in

class and writing a report. The full description will be available by the middle of October and the project will be due at the end of the term before the final exam period.

Discussion Forums: A discussion forum is available on the course page at Waterloo LEARN. This is meant to facilitate discussion regarding the course material and related topics, you may not post solutions or hints for an ongoing assignment. I reserve the right to moderate all forum discussions.

Expectations: Students are expected to attend all classes, take notes during classes, and complete all assignments, exams, and projects. Many of the concepts and techniques introduced in this course are likely brand new to most students and the level of difficulty of the topics fluctuates often, so please consider spending extra time during the week going over the course material. Students having difficulty should see the instructor for assistance as soon as possible.

Note For Students With Disabilities: The Office for Persons with Disabilities (OPD), located in Needles Hall 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with OPD at the beginning of each academic term.

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility.

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70 Student Petitions and Grievances, Section 4,
http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm

Discipline: A student is expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about rules for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 Student Discipline,
http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm

Avoiding Academic Offenses: Most students are unaware of the line between acceptable and unacceptable academic behaviour, especially when discussing assignments with classmates and using the work of other students. For information on commonly misunderstood academic offenses and how to avoid them, students should refer to the Faculty of Mathematics Cheating and Student Academic Discipline Policy,
http://www.math.uwaterloo.ca/navigation/Current/cheating_policy.shtml

Appeals: A student may appeal the finding and/or penalty in a decision made under Policy 70 Student Petitions and Grievances (other than regarding a petition) or Policy 71 Student Discipline if a ground for an appeal can be established. Read Policy 72 Student Appeals,
http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm