



Concordia University
Concordia Institute for Information Systems Engineering
INSE 6441/2 DD - Applied Game Theory and Mechanism Design
(Fall 2014) (4 credits)

1. General Information

- Course: INSE 6441/2 DD – Applied Game Theory and Mechanism Design (4 credits)
- Lectures: Thursday, 17:45 – 20:15, **FG-B080**
- Instructor: Jamal Bentahar, *Ph.D., P.Eng.*, Concordia Institute for Information Systems Engineering, ENCS.
- Office: EV7.630, extension 5382, bentahar@ciise.concordia.ca
- Office Hours: Monday from 10:00 a.m. to 12:00 p.m.
- Course Website: <http://www.ciise.concordia.ca/~bentahar/inse6441.html>

You can use this web site to get lecture notes, useful links, assignments, and other useful information. It is highly advised to visit the web site regularly.

2. Course Description

- This course presents the main concepts in game theory and mechanism design along with applications. It introduces equilibrium and solution concepts; strategic reasoning; mixed strategies; extensive-form games; repeated games; Bayesian games; coalitional games; social choice; voting scheme; fundamentals of mechanism design; revelation principle; efficient mechanisms; incentive compatibility; incentives and information security; auctions; and application on trust and services computing. Students will discover various concepts and techniques developed in recent research about applied game theory and mechanism design and learn how to apply them through lectures, readings, assignment, and team project. Several materials from different sources will be used, particularly scientific papers.
- Prerequisites: none. **Good knowledge of mathematics and probability will be very helpful**

3. Learning Outcomes

- By the end of this course, students should be able to:
 1. Understand principles of game theory and mechanism design.

2. Understand and apply game theoretic and mechanism design models for engineering applications.
3. Be aware of new developments in the area of game theory and mechanism design for intelligent systems.

4. Schedule

- Weeks 1 & 2: Introduction to Game Theory and Mechanism Design.
- Week 3: Mixed Strategy.
- Week 4: Solution Concepts.
- Week 5: Extensive-Form Games.
- Week 6: Repeated Games.
- Week 7: Bayesian Games (Midterm).
- Week 8: Coalitional Games.
- Week 9: Applications of Cooperative and Coalitional Games.
- Week 10: Social Choice.
- Week 11: Mechanism Design.
- Week 12: Efficient Mechanisms (VSG).
- Week 13: Project Presentations and Discussions.

5. Course Materials

- Textbook:
 - **Lecture Notes + Papers**
- Readings:
 - Essentials of Game Theory: A Concise Multidisciplinary Introduction
 - Authors: Kevin Leyton-Brown and Yoav Shoham.
 - Publisher: Morgan & Claypool, 2008.
 - Algorithmic Game Theory
 - Authors: Noam Nisan, Tim Roughgarden, Eva Tardos, Vijay V. Vazirani.
 - Publisher: Cambridge University Press, 2007.

6. Assignments and Grading

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| 1. Assignment: | 10% |
| 2. Midterm Exam (closed book): | 25% |
| 3. One Team Project (2 members, presentation + report) | 30% |
| 4. Final Exam (closed book): | 35% |

- **Details:**

1. Homework Assignment: must be done in groups of 2. Due dates are: October 16, 2014.

Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count towards the 5 days). Assignments that are more than 5 days late are penalized by 100%. The solutions will be posted on the course website. **No submissions will be allowed after the solutions are published.**

Submit the signed [Expectations of Originality form](#) with each homework assignment.

2. Midterm Exam: will focus on the first 7 Lectures.
3. Final Exam: will take place at the end of the semester. Students should not make any specific arrangements to leave the city until the final exam date is posted.

- **Failing Grade:**

Plagiarism, absenteeism, lack of preparation, and lack of effort will result in a failing grade.

7. Academic Code of Conduct

Academic Integrity

Any form of cheating, plagiarism, personation, falsification of a document as well as any other form of dishonest behaviour related to obtaining academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and **may lead to severe penalties up to and including suspension and expulsion.**

As examples only, you are not permitted to:

- Copy from anywhere without indicating where it came from
- Let another student copy your work and then submit it as his/her own
- Hand in the same assignment in more than one class
- Have unauthorized material or devices in an exam. Note that you do not have to be caught using them – just having them is an offence
- Copy from someone's else exam
- Communicate with another student during an exam
- Add or remove pages from an examination booklet or take the booklet out of an exam room
- Acquire exam or assignment answers or questions
- Write an exam for someone else or have someone write an exam for you
- Submit false documents such as medical notes or student records
- Falsify data or research results

You are subject to the Academic Code of Conduct. Take the time to learn more at

<http://provost.concordia.ca/academicintegrity/>

8. Student's Responsibilities

- Students are expected to attend every class. Some material may only be covered in class and not made available on the course website. Students are expected to read the assigned material and to actively participate in class discussions.
- Students are expected to be respectful of other people's opinions and to express their own views in a calm and reasonable way. Disruptive behaviour will not be tolerated.
- Students are expected to be familiar with the Code of Rights and Responsibilities:
<http://rights.concordia.ca>

- If you cannot attend class for any reason, unforeseen or not, you are to come and talk or write to me as soon as possible.

9. Student Services

- **Concordia Counselling and Development** offers career services, psychological services, student learning services, etc.
<http://cdev.concordia.ca>
- **The Concordia Library Citation and Cycle Guides:**
<http://library.concordia.ca/help/howto/citations.html>
- **Advocacy and Support Services:**
<http://supportservices.concordia.ca>
- **Student Transition Centre:**
<http://stc.concordia.ca>
- **New Student Program:**
<http://newstudent.concordia.ca>
- **Office for Students with Disabilities:**
<http://supportservices.concordia.ca/disabilities/>
- **The Academic Integrity Website:**
<http://provost.concordia.ca/academicintegrity/>