

COURSE SYLLABUS

General Course Information

Course Title: Special Topics in Computational Game Theory

Course Number: CIIC 8015

Credit Hours: Three (3) per term

Contact Hours: Three (3) hours of lectures per week (45 hours total)

Pre-requisites

- Graduate Course

Course description as stated in Graduate Catalog (2007-2008)

Study of advanced topics in sciences and engineering of information and computing.

Purpose

To introduce the students to fundamental concepts and results in the new and exciting area of computational game theory and economics, to expose them to the state-of-the-art and applications, and provide them the ability to make significant contributions to this quickly developing research area.

Course Goals

At the end of the course, students should be able to

- describe and explain game-theoretic computational models and algorithms;
- describe, summarize, and present previous work;
- review and critic the scientific literature;
- recognize research opportunities and open problems;
- apply existing models and algorithms to new domains; and
- identify potential novel applications.

Textbook

- Noam Nisan, Tim Roughgarden, Éva Tardos, and Vijay V. Vazirani. *Algorithmic Game Theory*. Cambridge University Press, 2007.

Topic Outline

Topic	Contact Hours
Introduction and Fundamentals	3
Compact Representations and Network Models	6
Algorithms and Computational Complexity	6
Learning in Games	3
Evolutionary Game Theory	3
Mechanism Design	3
Revealed Preferences and Learning Games	3
Applications	6
Topic presentations	9
Project presentations	3
Total	45 contact hours Three (3) credit hours per term

Instructional Strategies

- Conference/Lecture
- Classroom discussions
- Presentations

Requirements

All students are expected to

- follow all department, campus and university policies, including attending every lecture and presentation;
- be on time to every class;
- complete all assigned reading *before lecture*;
- come to class prepared to understand the new material to be presented in class;
- participate in class discussions;
- complete and turn in every assigned homework (e.g., project progress reports, topic and project reports, topic and project presentations) on time;
- pass all evaluations to receive credit for the course (see section on **Evaluation**).

While some student collaboration is acceptable, *each student is required to turn in his/her own work*. As an honor code's general rule-of-thumb, *do not write your name on any work that you do not understand*. (See note on **Ethics** in section on **Department/Campus Policies**.)

Department/Campus Policies

1. **Class attendance:** *Class attendance is compulsory.* The University of Puerto Rico, Mayagüez Campus, reserves the right to deal at any time with individual cases of non attendance. Professors are expected to record the absences of their students. Frequent absences affect the final grade, and may even result in total loss of credits. Arranging to make up work missed because of legitimate class absence is the responsibility of the student. (Bulletin of Information Undergraduate Studies, pp 39 1995-96)
2. **Absence from examinations:** Students are required to attend all examinations. If a student is absent from an examination for a justifiable reason acceptable to the professor, he or she will be given a special examination. Otherwise, he or she will receive a grade of zero or "F" in the examination missed. (Bulletin of Information Undergraduate Studies, pp 39, 1995-96)
3. **Final examinations:** Final written examinations must be given in all courses unless, in the judgment of the Dean, the nature of the subject makes it impracticable. Final examinations scheduled by arrangements must be given during the examination period prescribed in the Academic Calendar, including Saturdays. (see Bulletin of Information Undergraduate Studies, pp 39, 1995-96).
4. **Partial withdrawals:** A student may withdraw from individual courses at any time during the term, but before the deadline established in the University Academic Calendar. (see Bulletin of Information Undergraduate Studies, pp 37, 1995-96).
5. **Complete withdrawals:** A student may completely withdraw from the University of Puerto Rico, Mayagüez Campus, at any time up to the last day of classes. (see Bulletin of Information Undergraduate Studies, pp 37, 1995-96).
6. **Disabilities:** All the reasonable accommodations according to the Americans with Disability Act (ADA) Law will be coordinated with the Dean of Students and in accordance with the particular needs of the student. **According to Law 51:** Students will identify themselves with the Institution and the instructor of the course for purposes of assessment (exams) accommodations. For more information please call the Student with Disabilities Office which is part of the Dean of Students office (Chemistry Building, room 019) at (787)265-3862 or (787)832-4040 extensions 3250 or 3258.
7. **Ethics:** Any academic fraud is subject to the disciplinary sanctions described in article 14 and 16 of the revised General Student Bylaws of the University of Puerto Rico contained in Certification 018-1997-98 of the Board of Trustees. The professor will follow the norms established in articles 1-5 of the Bylaws.

Please see the Campus Undergraduate Catalog for further information.

Evaluation Strategies

Criteria	Quantity	Percent
Class participation		20%
Topic report	1	10%
Topic oral presentation	1	10%
Project proposal	1	5%
Project progress reports	2-4	5%
Project oral presentation	1	20%
Project final report	1	30%
Total		100%

Grading Scale

90-100	A
80-89	B
70-79	C
60-69	D
0-59	F

References

- John von Neumann and Oskar Morgenstern. *Theory of Games and Economic Behavior*.
- Drew Fudenberg and Jean Tirole. *Game Theory*. MIT Press, 1991
- Gillermo Owen. *Game Theory*. Academic Press, Third edition, 1995.