AH2205 Game Theory 7.5 credits

Spelteori

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for AH2205 valid from Autumn 2008

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Specific prerequisites

Mathematical background from the two first years on Programmes at KTH

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The student should be able to identify game situations within different disciplines, and analyse these with game theoretic concepts. The student should be able to choose tools and solution concepts for real world game theoretic applications, and also to describe their pros and cons. If applicable, the student should be able to program an algorithm for different applications, such as internet auctions, routing, procurement etc. Finally, the student should be able to aquire new information from the scientific literature and account for for a new solution concept or algorithm, and also to assess the usefulness for a given problem.

Course contents

The course is divided into part I and part II. In the first part many different concepts will be introduced, including games on normal form, extensive form, incomplete information, static and repeated games, bounded rationality, auctions, mechanism design, evolutionary game theory, Markov games and learning in games. Many different solution concepts will be introduced, and their realism visavi different applications will be assessed.

As a part of the examination, the student will choose a game strategy in different games, and motivate them from a game-theoretic point of view. The outcome of their strategies will be analysed in a game with other students. Part I ends with a written exam, where the student is asked to analyse real world problems using game theoretic tools.

Part II is project based. The students will participate in a game, which changes from year to year. Examples of games include internet auctions, combinatorial auctions, procurement of public pension funds, routing etc. The students should program, in groups, a strategy (or an algorithm) which will participate in a game with the other students' algorithms. The project will be assessed partly by the performance in the outcome of the game, partly by a written report. To analyse the outcome, given the written reports from other students, is an important part of the project.

Course literature

A course in Game Theory by Osborne and Rubinstein.

Examination

- INL1 - Assignment, 1.5 credits, grading scale: P, F
- PRO1 - Project, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 1.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Written exam (TEN1; 1,5 cr), Assignments (INL1; 1,5 cr) and Project (PRO1; 4,5 cr)

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.