FEL3240 Games, Decisions and Information 7.0 credits

Spel, beslut och information

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

Establishment

Course syllabus for FEL3240 valid from Autumn 2011

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

Language of instruction

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

Intended learning outcomes

To give students a basic understanding of game theoretical concepts and the role of information in decision making, and to show possibilities for the use of game theory in systems engineering and social sciences. By the end of the course the student should

• be able to define Nash and Stackelberg equilibrium.

- be able to solve matrix games, quadratic games, and understand the principles of solving general convex-concave games.
- be able to define Ky-Fan convexity and use it in nonconvex games.
- be familiar with solving cooperative and noncooperative games and team problems in simpler settings, such as linear quadratic settings.
- give examples where the role of information and signaling in games affect the costs of the players.
- explain the revelation principle in auction design and its consequences.
- be able to define dynamic games.
- be able to solve linear quadratic games of discrete-time dynamical systems.
- know the principles of solving dynamaic games using Hamilton-Jacobi-Bellman-Isaac´s equation.
- formulate relevant real life problems in a game theoretic framework.

Course contents

Static games, Nash equilibrium, generalized convexity notion in games, team decision theory, price mechanism design, network games, dynamic games, robust control, Hamilton-Jacobi-Bellman-Isaac´s equation, distributed communication and control, network games.

Disposition

Lectures, exercises, homework, presentation of selected topic.

Examination

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

- Oral and written presentation of a selected topic.
- Oral presentations of homework problems.
- Weekly hand-in assignements.

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.