

Game Theory and Optimal Decisions

Subject area: Mathematics

University:	CTU
Level:	BA2, BA3, BA4, MA all years
Teaching mode:	blended: mostly online, but presence on campus required in certain period
Instructor(s):	Magdalena Hykšová

Short description

The aim of the course is to provide the survey of the part of game theory whose main purpose is to clarify, what can be considered as an optimal decision in situations when the conflict of interests of decision makers or institutions occurs. The description of particular conflicts uses the techniques of mathematical modeling. Seminars are devoted to rich applications of particular parts, mainly to the transportation and economics.

Full description

The course consists of lectures and practical exercises devoted to various applications and further discussion of relevant concepts. The course covers the following topics: Classification and mathematical models of decision situations, history. Utility theory, rational choice theory. Explicit form games. Normal form games. Bimatrix games. Repeated games. Antagonistic conflict – theory of matrix games. Two-person cooperative games without transferable payoffs. N-person cooperative games. Power indices. Decisions under risk and uncertainty

Learning outcomes

Knowledge of basic concepts and methods of game theory.

General information

Contact hours per week:	2
Total workload:	50 (in student hours for the whole course)
ECTS credits:	2
Language:	English

Course start date:	20 February 2023
Course end date:	28 May 2023
Add. info about start date:	Start course date refers to starting date of spring semester at CTU. Schedule will be available 1 or 2 weeks before semester starts.
Weekly teaching day/time:	
Time zone:	CET (Denmark, Germany, France, Netherlands, Switzerland, Czech Republic)
Further information:	Online lessons will be recorded and provided to students
Prerequisites:	Basic undergraduate calculus
Activities and methods:	Lectures, Exercises, Tutorial sessions
Presence on campus:	5 days at the end of semester (presentation of seminar works, tutorial sessions, final exam)

Final examination

Form:	written
Date:	
Location/format:	on campus of host institution
Re-sit possibility:	
Transcript available:	end of semester
Add. info/requirements:	To pass the subject, an orally defended seminar work and a final exam (solution of 5 problems covering the topics discussed during the course) are required.

Registration

To register for this course, follow the registration requirements of your **home university** as specified here: www.euroteq.eu/courses-registration.

Administration

Number of places:	25
Minimum participants:	5
Internal course code:	11TER
Contact:	hyksova@fd.cvut.cz

This course is part of the EuroTeQ Engineering University joint course catalogue 2023. This is a collaborative activity of the partner universities DTU, L'X, TU/e, TalTech, CTU, TUM as well as Technion. Students from these universities can participate in the offered courses. It is the responsibility of the student to check if you fulfil the requirements to participate in a specific course. Students are also advised to check with their home institution how to get recognition of the ECTS credits gained in courses of the EuroTeQ course catalogue. For further information about EuroTeQ Engineering University, visit www.euroteq.eu or get in touch with the above-mentioned point of contact.