Tárgy neve: Game theory

Tárgyfelelős neve: Szidarovszky Ferenc

Tárgyfelelős tudományos fokozata: DSc, egyetemi tanár

Tárgyfelelős MAB szerinti akkreditációs státusza: AE

Az oktatás célja angolul:

a) knowledge

- In order to be able to perform their work in an innovative way and do research (when necessary) in their own IT specialization, they have comprehensive and up-to-date knowledge of general mathematical and computing principles, rules and relationships, particularly – depending on their chosen specialization – in the following areas: algebraic, linear algebraic and number theory methods and applications, special fields of mathematical analysis, numerical methods and their applications; discrete mathematics, graph theory, logic and their applications; theoretical basics and applications of stochastic modelling and statistics; first-order and second-order statistical analysis, operation research; algorithmic methods in mathematics, formal models and tools in computing science, complexity and efficiency theory of algorithms, and special algorithms of application fields.
- They have comprehensive and up-to-date knowledge of the principles, methods, and procedures for designing, developing, operating, and controlling IT processes, particularly – depending on their chosen specialization – in the areas of program design methods; design, construction and management of complex software systems and databases in modern database management systems; service-oriented program design; the design, construction and management of information systems; the design and development of tools and services for the internet; the design, development and management of database systems; the design, construction and management of distributed systems, cryptography, data security and data protection.
- They are familiar with the principles of business, organizational and corporate procedure, information, data, software and technical-technological architectures as well as with the methods of describing and designing these architectures.
- They are aware of the vital basics of organization and management, quality assurance and controlling, which enable them to carry out leadership and management duties related to their specialization.

b) skills and abilities

- They are able to formalize complex IT tasks, to identify and study their theoretical and practical background and then to solve them.
- They are able to initiate collaboration and work in a team as well as on projects with IT or other professionals.
- They are familiar with IT professional vocabulary, which enables them to express themselves at a high level, both orally and in writing, in their mother tongue and (at least) in English; i.e. they are able to participate in discussions and debates, to write reports, to work with, understand and utilize scientific and technical literature (e.g. professional books, chapters, articles etc.).
- They are able to professionally use scientific and technical information sources to obtain knowledge necessary for solving a problem, and to critically interpret and evaluate it.
- Under professional guidance, they are able to carry out scientific research on their own, and to prepare for further studies at postgraduate level.

c) attitude

- They follow professional and technological developments in their IT field.
- They are committed to critical feedback and evaluation based on self-examination.

- They are committed to lifelong learning and they are open to acquiring new IT competencies.
- They accept and make their co-workers apply the ethical principles of work and organizational culture as well as those of IT scientific research.
- They share their knowledge and consider it important to disseminate professional IT results.
- They are open to proactive collaboration with IT and other professionals.

d) autonomy and responsibility

- They take responsibility for their professional decisions made in their IT-related activities.
- They undertake to meet deadlines and to have deadlines met.
- They bear responsibility for their own work as well as for the work of their colleagues they work together with in a project.

Az oktatás tartalma angolul:

The notion of equilibria is first illustrated with other decision problems and examples from all fields of applied sciences: social relations, economics, market and advertisement, engineering, environmental issues, homeland security, military

Special types of games are introduced with existence and uniqueness of equilibria: including

finite games, zero-sum games, finite tree games, continuous games

Relation of equilibria with fixed point and optimum problems

Continuous

Special games will be examined, matrix games, bimatrix games, oligopolies

Uniqueness of equilibria

Other solution concepts and methods:

Leader-follower games, Stackelberg equilibria

Cooperative games with solutions: characteristic function games, core, Shapley values

Social choice methods: plurality voting, Borda count, Hare system (successive deletions), pairwise comparisons, dictatorship

Conflict resolution: method based on individual decisions, Nash bargaining solution, area monotonic solution, equal sacrifice solution, Kalai-Smorodinsky solution

Case studies will illustrate the application of the learned methodology:

restaurant selection

buying a family car

restoration of a chemical landfill

A számonkérés és értékelés rendszere angolul:

practical course mark

Idegen nyelven történő indítás esetén az adott idegen nyelvű irodalom:

Text book, compulsory:

- Matsumoto, A. and F. Szidarovszky. Game theory and its applications. Springer Japan, Tokyo, 2016.

Proposed further reading:

- Osborn, M. J. An introduction to game theory. Oxford University Press, New York, 2004.
- Gibbons, R. Game theory for applied economists. Princeton University Press, Princeton,1992.