M048	**Decision Theory**	L	P	S	ECTS
		1	0	1	4

Course objectives. Introduce students to basic ideas and methods from decision theory. Motivate students by using illustrative examples for investigation of problems from decision theory. Demonstrate basic methods for solving these problems.

Prerequisites. Undergraduate study programme in mathematics or computer science.

Course content.
1. Introduction: basic terms, the process of decision making.
2. Decision making under uncertainty. Table of decision making, basic criteria for analysis in case of uncertainty. Expected value. Tree of decision making.
3. Multiple-criteria decision analysis, relations, preference relation. Methods which use referent points. Methods for determining weights in criterions, method of eigenvector, method of entropy, hierarchical decision making (AHP method).
4. Group decision making, methods for group decision making.

LEARNING OUTCOMES

No.	LEARNING OUTCOMES
1.	Explain the process of solving in decision making problems.
2.	Recognize elements of decision making in applications.
3.	Apply methods for decision making in different models.
4.	Compare different decision making methods.
5.	Develop models for solving multiple-criteria decision problems.
6.	Use basic methods for group decision making.
7.	Use computers and appropriate informational systems for support in decision making.

RELATING THE LEARNING OUTCOMES, ORGANIZATION OF THE EDUCATIONAL PROCESS AND ASSESSMENT OF THE LEARNING OUTCOMES

TEACHING ACTIVITY	ECTS	LEARNING OUTCOME **	STUDENT ACTIVITY*	EVALUATION METHOD	POINTS	
					min	max
Attending lectures and exercises	0.5	1-7	Lecture attendance, discussion, team work and independent work on given tasks and short exams	Attendance lists, tracking activities exams	0	4
Seminar assignment	0.5	1-7	Independent work on exercise	Seminar evaluation	0	4
Written exam (Mid-terms)	2	1-7	Preparing for written exam	Evaluation	25	46
Final exam	3	1-7	Revision	Oral exam	25	46
TOTAL	6				50	100

Teaching methods and student assessment. Lectures and seminars are obligatory. Students will obtain practical seminar assignments. Exam is held after lectures and after completion of seminar

assignment and it includes a written and an oral part. Complex exams will be solved using mathematical software on computers. Students can take mid-term exams during the semester. Acceptable mid-term exam scores replace the written examination. Students can do their homework and thus improve their final grade. Moreover, seminar assignment also have influence on the final grade.

Can the course be taught in English: Yes

Basic literature:

1. S. French, Decision Theory, Ellis Harwood, Chichester, 1986.

Recommended literature:

1. M.R..Klein, L.B.Methlie, Knowledge-based Decision Support Systems, I.Wiley&Sons, 1995.
2. T.X.Bui, Co-oP, A Group Decision Support System for Cooperative Multiple Criteria Group Decision Making, Springer-Verlag, Berlin, 1987.
3. T.Gal, T.J.Stewart, T.Hanne (eds.): Multicriteria decision making, Advances in MCDM Models, Algorithms, Theory, and Applications, Kluwer Academic Publichers, Dordrecht/Boston/London, 1999.
4. Roger B. Myerson, Game Theory: Analysis of conflict, Harvard University Press, Cambridge, London, England, 1997.
5. E.Triantaphyllou, Multi-Criteria Decision Making Methods: A Comparative Study, Kluwer Academic Publishers Dordrecht/Boston/ London, 2000.