Zał. nr 4 do ZW 64/2012

Faculty of Computer Science and Management

SUBJECT CARD

Name in Polish: Gry i decyzje w zarządzaniu
Name in English: Games and decisions in management
Main field of study (if applicable): Management
Specialization (if applicable): Business Information Systems
Level and form of studies: 2nd level, full-time
Kind of subject: obligatory
Subject code: IEZ2204
Group of courses NO

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	**30**	**15**			
Number of hours of total student workload (CNPS)	**90**	**60**			
Form of crediting	**Exam**	**Crediting with grade**			
For group of courses mark (X) final course					
Number of ECTS points	**3**	**2**			
including number of ECTS points for practical (P) classes		**2**			
including number of ECTS points for direct teacher-student contact (BK) classes	**1**	**0.5**			

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic skills in operations research, algebra and logic.

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SUBJECT OBJECTIVES

C1. Presenting various types of decision situations depending on the number of participants and the type of environment.
C2. Presenting noncooperative and cooperative games and their applications to decision making.
C3. Showing some methods of decision making under risk and uncertainty.
C4. Showing some practical applications of game theory and decision theory; solving exercises on game theory and decision theory.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 - Knows and understands theoretical foundations, advanced formal methods, and decision support tools, including discrete optimization, decision theory, and game theory in solving practical decision-making problems.

relating to skills:

PEK_U01 - Can choose and use advanced formal methods and decision support tools.

relating to social competences:

PEK_K01 – Is ready to identify, critically analyze and solve problems that arise in practice. Can anticipate the effects of his decisions.

PEK_K02 – Is ready to explore and select flexibly the methods and tools for solving problems that arise in practice.

PROGRAMME CONTENT		
Form of classes - lecture		**Number of h.**
Lec 1	Classification of decision situations; games in extensive and normal form	2
Lec 2	Games in extensive and normal form, the concepts of strategy and equilibrium	2
Lec 3	Noncooperative 2-person zero-sum games – formulation, applications and methods of solving	
Lec 4	Noncooperative 2-person nonzero-sum games – formulation, applications and methods of solving, part I	2
Lec 5	Noncooperative 2-person nonzero-sum games – formulation, applications and methods of solving, part II	2
Lec 6	Noncooperative *n*-person games – applications. Price of anarchy and price of stability.	2
Lec 7	Cooperative 2-person games – applications and Nash solution concept	2
Lec 8	Cooperative *n*-person games – applications, the concept of a core and Shapley value, part I	2
Lec 9	Cooperative *n*-person games – applications, the concept of a core and Shapley value, part II	2
Lec 10	Decision making under risk – von Neumann and Morgenstern utility theory	2
Lec 11	Decision making under uncertainty – basic criteria for decision making	2
Lec 12	Decision making under uncertainty – advanced topics and applications to optimization	2
Lec 13	Group decision making, Arrow’s paradox	2
Lec 14	Applications of decision theory, part I	2
Lec 15	Applications of decision theory, part II	2
	Total hours:	**30**

Form of classes - class		**Number of hours**
Cl 1	Applications and methods of solving 2-person zero-sum games	1
Cl 2	Applications and methods of solving 2-person nonzero-sum games	2

Cl 3	Applications and methods of solving 2-person nonzero-sum games	2
Cl 4	Applications and methods of solving cooperative *n*-person games	2
Cl 5	Applications and methods of solving cooperative *n*-person games	2
Cl 6	Applications and methods of solving decision problems under risk and uncertainty	2
Cl 7	Applications and methods of solving decision problems under risk and uncertainty	2
Cl 8	Written test	2
	Total hours	**15**

TEACHING TOOLS USED
N1. Presentation N2. Case study N3. Solving exercises

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end)	Educational effect number	Way of evaluating educational effect achievement
F1	PEK_W01	Exam
F2	PEK_U01	Written test
P=1		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] R.D. Luce, H. Raiffa. Games and decisions. Introduction and critical survey. Dover Publication Inc. 1957
[2] H. Peters. Game Theory. A multi-level approach. Springer 2008
[3] R. Myerson. Game Theory: Analysis of conflict, Harvard University Press, 1997

SECONDARY LITERATURE:

[1] M. Osborne, A. Rubinstein. A course in game theory. MIT 1994
[2] Algorithmic game theory. N. Nisan, T. Roughgarden, E. Tardos, V. Vazirani (eds.). Cambridge University Press 2007
[3] E. Gura, M. B. Maschler. Insights into game theory. An alternative mathematical experience. Cambridge University Press 2008
[4] A. Kelly. Decision making using game theory. An introduction for managers. Cambridge University Press 2003

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
Games and decisions in management
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY Management
AND SPECIALIZATION Business Information Systems

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)**	Subject objectives***	Programme content***	Teaching tool number***
PEK_W01	S2_BIS_W02	C1, C2, C3	Lec1 –Lec15	N1, N2, N3
PEK_U01	S2_BIS_U02	C1, C2, C3, C4	Cl1 - Cl7	N2, N3

** - enter symbols for main-field-of-study/specialization educational effects
*** - from table above