GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Decision analysis, PG_00045316		
Field of study	Data Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	English
Semester of study	5	ECTS credits	6.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Informatics in Management -> Faculty of Management and Economics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Bartosz Woliński	
	Teachers	dr inż. Bartosz Woliński	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	30.0	0.0	0.0	60

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	60	8.0	82.0	150

Subject objectives

The aim of the lecture is to discuss the issues concerning decision analysis and rationale procedures based on the heuristics, descriptive and simulative methods in the context of the applications in management area.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W06] Knows the criteria and concepts of artificial intelligence, understands the operation of algorithms for intelligent computing, the concept of descriptive logic, combinatorial optimization algorithms, methods of construction, analysis and evaluation of algorithms, including discrete ones and problems of resolving conflicts in non-algorithmic decision making.		
[K6_U10] correctly uses legal norms as well as ethical and cognitive rules in solving specific socio-economic problems.	Knowledge of descriptive methods Extended knowledge of decision analysis applied in economics	[SU1] Assessment of task fulfilment
[K6_K02] is aware of the role of a technical university graduate in the society; reflects on ethical, scientific and social aspects of the performed work; understands the necessity of participation in social projects and complies with copyright law, taking into account economic, legal and technical aspects.	Understanding the basic problems with decision-making Understanding the need for systematic analysis and systematic evaluation decisions	[SK2] Assessment of progress of work

<table>
<tr><td>Subject contents</td><td>LECTURES

• Introduction. Decisions in management. Decision-making process and its description.
• A decision typology. Decisions-making process and problems troubleshooting.
• Decision trees concept and construction. Risk factors identification.
• AHP foundations. Problem analysis and decision-making based on the AHP.
• Sensitivity analysis in problem solving and decision-making processes.
• ELECTRE foundations. Decision-making construction model.
• Typical problems of decision-making. Group decision making.
• Decision rules. Barriers to decision-making. Visualization decision.
• Construction of decision-making models - linear programming models.
• Railway model.
• Simulation models
• Game Theory.
• Basic concepts of statistical decision theory.
• Statistical hypothesis testing, point estimation, classification.

LAB

• Pivot tables and reports.
• Investment analysis using decision trees.
• Scenario analysis. Identification, classification, and risk analysis. Case study.
• AHP application. A case study.
• Students’ project presentation.
• ELECTRE application. A case study
• Students’ project presentation.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>No requirements</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>exam</td><td>50.0%</td><td>60.0%</td></tr><tr><td>colloquium</td><td>50.0%</td><td>40.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>Winston W.L.: Operations Research: Applications and Algorithms. Cengage Learning 2003.

Hillier F. S., Lieberman G. J.: Introduction to Operations Research. Stanford University 2010.

Parnell G. S., Driscoll P. J. : Decision Making in Systems Engineering and Management. John Wiley 2011.</td></tr><tr><td>Supplementary literature</td><td>Bakke D.: The Decision Maker: Unlock the Potential of Everyone in Your Organization, One Decision at a Time Hardcover. Pear Press 2013.

Patton B. R.: Decision-Making Group Interaction: Achieving Quality. Pearson 2002.

Goodwin P., Wright G.: Decision Analysis for Management Judgment. Wiley 2014.</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Analysis of study executive in terms of location and construction of an industrial facility.

Simulation game for settlement of commercial contracts. Decision rules construction.

Building the knowledge base for health care facilities.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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