



## Subject card

Subject name and code	Decision analysis, PG_00045316						
Field of study	Data Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
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_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		
	[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_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.						

Subject contents	<p>LECTURES</p> <ul style="list-style-type: none"> <li>• Introduction. Decisions in management. Decision-making process and its description.</li> <li>• A decision typology. Decisions-making process and problems troubleshooting.</li> <li>• Decision trees concept and construction. Risk factors identification.</li> <li>• AHP foundations. Problem analysis and decision-making based on the AHP.</li> <li>• Sensitivity analysis in problem solving and decision-making processes.</li> <li>• ELECTRE foundations. Decision-making construction model.</li> <li>• Typical problems of decision-making. Group decision making.</li> <li>• Decision rules. Barriers to decision-making. Visualization decision.</li> <li>• Construction of decision-making models - linear programming models.</li> <li>• Railway model.</li> <li>• Simulation models</li> <li>• Game Theory.</li> <li>• Basic concepts of statistical decision theory.</li> <li>• Statistical hypothesis testing, point estimation, classification.</li> </ul> <p>LAB</p> <ul style="list-style-type: none"> <li>• Pivot tables and reports.</li> <li>• Investment analysis using decision trees.</li> <li>• Scenario analysis. Identification, classification, and risk analysis. Case study.</li> <li>• AHP application. A case study.</li> <li>• Students' project presentation.</li> <li>• ELECTRE application. A case study</li> <li>• Students' project presentation.</li> </ul>											
Prerequisites and co-requisites	No requirements											
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Subject passing criteria</th> <th style="width: 33%;">Passing threshold</th> <th style="width: 33%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>colloquium</td> <td>50.0%</td> <td>40.0%</td> </tr> <tr> <td>exam</td> <td>50.0%</td> <td>60.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	colloquium	50.0%	40.0%	exam	50.0%	60.0%
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Recommended reading	Basic literature	<p>Winston W.L.: Operations Research: Applications and Algorithms. Cengage Learning 2003.</p> <p>Hillier F. S., Lieberman G. J.: Introduction to Operations Research. Stanford University 2010.</p> <p>Parnell G. S., Driscoll P. J. : Decision Making in Systems Engineering and Management. John Wiley 2011.</p>										
	Supplementary literature	<p>Bakke D.: The Decision Maker: Unlock the Potential of Everyone in Your Organization, One Decision at a Time Hardcover. Pear Press 2013.</p> <p>Patton B. R.: Decision-Making Group Interaction: Achieving Quality. Pearson 2002.</p> <p>Goodwin P., Wright G.: Decision Analysis for Management Judgment. Wiley 2014.</p>										
	eResources addresses											
Example issues/ example questions/ tasks being completed	<p>Analysis of study executive in terms of location and construction of an industrial facility.</p> <p>Simulation game for settlement of commercial contracts. Decision rules construction.</p> <p>Building the knowledge base for health care facilities.</p>											
Work placement	Not applicable											