



## Subject card

Subject name and code	Decision analysis, PG_00045316						
Field of study	Decision analysis						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
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 -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Nina Rizun				
	Teachers		dr Nina Rizun				
Lesson types	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						
	eNauczanie source addresses: Moodle ID: 46765 Decisions Analysis 2025/2026 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46765">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46765</a>						
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 course is to prepare students to make well-grounded and ethical decisions in complex problem situations, based on knowledge of models and methods supporting the decision-making process, including risk analysis, uncertainty, and multi-criteria decision making. It also aims to develop attitudes related to responsibility, critical thinking, and openness to the use of modern analytical tools in the context of managing organizations and addressing economic and social problems.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U10] correctly uses legal norms as well as ethical and cognitive rules in solving specific socio-economic problems.	The student possesses knowledge of approaches and methods supporting the decision-making process, including optimization algorithms, heuristics, and risk analysis tools. They know the methods of acquiring and interpreting information and understand their application to solving complex problems involving multiple variables, limited data, and decision conflicts	[SU1] Ocena realizacji zadania [SU4] Ocena umiejętności korzystania z metod i narzędzi [SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania
	[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.	The student is able to consciously make well-founded and ethical decisions that take into account economic, social, and environmental consequences, particularly through reflection on the impacts of actions and participation in teamwork on decision-making projects	[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym
	[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.	The student is able to apply decision support approaches and models in an organizational environment, using legal norms as well as ethical and cognitive rules to acquire and interpret information under conditions of risk and uncertainty, and subsequently to formulate multi-criteria, well-founded decisions	[SK2] Ocena postępów pracy [SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce
Subject contents	<p>LECTURES</p> <ul style="list-style-type: none"> <li>• Decision making vs problem solving</li> <li>• Models in decision-making process</li> <li>• Deterministic models</li> <li>• Discrete variables</li> <li>• Sensitivity Analysis</li> <li>• Complex problems and heuristics solutions</li> <li>• Complex problems</li> <li>• Evolutionary algorithms</li> <li>• Non-linear programming</li> <li>• Risk and Uncertainty</li> <li>• Decision trees</li> <li>• Utility theory</li> <li>• Risk premium and risk aversion</li> <li>• Multi-criteria decision making</li> </ul> <p>LAB</p> <ul style="list-style-type: none"> <li>• <a href="#">Decision-making theory: Data preprocessing casePlik</a></li> <li>• Linear programming (LP) geometric approach</li> <li>• Linear programming (LP) using SOLVER</li> <li>• Linear programming (LP) for integer models</li> <li>• Binary and mixed variables models</li> <li>• Non-linear problems</li> <li>• Network problems</li> <li>• Decisions under risk and uncertainty</li> <li>• Decision trees</li> <li>• Expected value. Utility value and risk premium</li> </ul>		
Prerequisites and co-requisites	No requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Closed open-problem based questions (final test)	60.0%	40.0%
	Laboratorium komputerowe	60.0%	10.0%
	Group project (assignment) with presentation	60.0%	50.0%

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>	
Practical activities within the subject	Not applicable	

Document generated electronically. Does not require a seal or signature.