GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Decision Sciences, PG_00067384		
Field of study	Engineering Management		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2027/2028
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	Polish
Semester of study	6	ECTS credits	3.0
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		
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	0.0	0.0	45

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	45	5.0	25.0	75

Subject objectives

Works in the organization, making rational decisions based on heuristic, descriptive and simulation methods, taking into account the context of management processes

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W03] knows reliable sources of information and utilizes advanced knowledge to explain contemporary management issues.	has knowledge of approaches that support decision-making in organizational settings and understands how to acquire and interpret information essential for analyzing complex decision scenarios	[SW3] Assessment of knowledge contained in written work and projects
[K6_U04] develops logical solutions to complex or unstructured problems, even under conditions of uncertainty.	is able to select appropriate decision-support methods and apply them to design solutions in situations involving multiple variables and limited information	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
[K6_K02] is prepared to make competent and ethical decisions to create and maintain economic, social, and environmental values, demonstrating entrepreneurial actions.	is able to make informed decisions with awareness of their broader economic, social, and environmental impact	[SK5] Assessment of ability to solve problems that arise in practice

<table>
<tr><td>Subject contents</td><td>LECTURES
Introduction. Management decisions. The decision-making process and the characteristics of its stages
Decision typology. Deciding and solving problems
Construction of decision trees. Identification of risk factors
Basics of the AHP method. Analysis of the decision problem using the AHP method
Sensitivity analysis of the decision problem solution
Building a decision model using the ELECTRE method
Typical decision problems. Group decision making
Decision rules. Decision making barriers. Decision visualization
Construction of decision models linear programming models
Train models
Simulation models
Game theory
Basic concepts of statistical decision theory
Hypothesis testing, point estimation, classification
LABORATORY
Pivot tables and reports
Conducting investment analyzes using decision trees
Scenario analysis. Identification, classification and risk analysis. Case study
Application of the AHP method. Case study
Presentation of own projects
Application of the ELECTRE method. Case study
Presentation of own projects</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></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>Laboratory assignment report</td><td>50.0%</td><td>40.0%</td></tr>
<tr><td>Lecture test</td><td>50.0%</td><td>60.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Witkowski T.: Decyzje strategiczne w zarządzaniu przedsiębiorstwem. WNT Warszawa 2000
Męczyńska A., Mularczyk A. (red.), Metody statystyczne i optymalizacyjne w arkuszu kalkulacyjnym MS Excel
Szapiro T.: Decyzje menedżerskie z Excelem. PWE Warszawa 2000
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>Supplementary 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>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Presentation of the optimal structure of manufactured products in terms of resources used
Presentation of the optimal investment decision using a decision tree
Finding the optimal route between several cities</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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