GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	DECISION SCIENCES, PG_00070648		
Field of study	Engineering Management		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
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	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Informatics In Management -> Faculty of Management and Economics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Nina Rizun	
	Teachers		

Lesson types

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	3.0	52.0	100

Subject objectives

to prepare students to make rational and justified decisions in complex organizational systems, based on knowledge of the analysis of processes and relationships between phenomena, and to shape attitudes of responsibility and ethical action in the context of creating economic, social and environmental values.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K02] is prepared to make competent and ethical decisions to create and maintain economic, social, and environmental values, demonstrating entrepreneurial actions.	is ready to consciously make justified and ethical decisions, taking into account economic, social, and environmental consequences, and actively participates in team-based projects focused on digital and social innovation.	[SK3] Assessment of ability to organize work
[K6_U04] develops logical solutions to complex or unstructured problems, even under conditions of uncertainty.	is able to develop logical solutions to complex and unstructured decision problems under conditions of uncertainty, applying quantitative and qualitative decision science methods, including optimisation models, scenario analysis, and decision-support tools.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject
[K6_W03] knows reliable sources of information and utilizes advanced knowledge to explain contemporary management issues.	knows and understands reliable sources of information as well as advanced concepts and models of decision sciences used to explain and interpret contemporary management problems, particularly in the areas of risk, uncertainty, and multi-criteria decision-making processes.	[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge

Subject contents	Course content – lecture 1. The decision-making process. 2. Decision-making modeling. 3. Multi-criteria decision support. 4. Methods for sorting alternatives. 5. Optimization under conditions of certainty. 6. Decision-making under conditions of risk and uncertainty. 7. Multi-attribute online decision-making driven by opinion mining 8. Social network analysis 9. The social context of decision-making. 10. Solving complex business problems. 11. Option planning in a volatile market environment. Course content – laboratory 1. Preparing the decision-making process. 2. Decision-making modeling using Excel (pivot tables, solver, and scenario search). 3. Problem definition (conceptualization) and development of decision alternatives. 4. Multi-criteria decision support 5. Decision-making scenarios under conditions of risk and uncertainty 6. Using decision trees 7. Social network analysis 8. Multi-attribute online decision-making driven by opinion mining
Prerequisites and co-requisites	
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Presentation of the results of decision-making tasks	60.0%	60.0%
Colloqual tests	60.0%	40.0%

Recommended reading	Basic literature	1. Gaspars-Wieloch, H. (2020). Podejmowanie decyzji w warunkach niepewności. Planowanie scenariuszowe, reguły decyzyjne i wybrane zastosowania ekonomiczne. Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu. https://doi.org/10.18559/978-83-66199-81-1 2. Kahneman, D. (2024). Pułapki myślenia. O myśleniu szybkim i wolnym. Wyd. Media Rodzina. 3. Gressel, Simone, Nazim Taskin, and David Pauleen. "Management decision-making, big data and analytics." (2020): 1-336.. 4. Nermend, K., Łatuszyńska, M., & Thalassinos, E. (Eds.). (2021). *Decision-making in management: Methods and behavioral tools*. Springer Nature. 5. Marchau, V. A. W. J., et al. "Decision making under deep uncertainty: from theory to practice." *(No Title)* (2019). 6. Materiały udostępniane na eKursie.
	Supplementary literature	1. Baj-Rogowska, A. (2020). Decyzje optymalne z Solverem (pp. 1-68). Politechnika Gdańska. 2. Heilig, Thorsten, and Ilhan Scheer. *Decision intelligence: Transform your team and organization with AI-Driven decision-making*. John Wiley & Sons, 2023. 3. Bakke D.: The Decision Maker: Unlock the Potential of Everyone in Your Organization, One Decision at a Time Hardcover. Pear Press, 2013. 4. Fisher, T., & Adams, R. (2018). Problem Solving in Organizations: A Methodological Handbook for Business and Management Students
	eResources addresses	
Example issues/ example questions/ tasks being completed	• Applying the decision-making process to an example situation. • Presenting the optimal production structure in terms of resource utilization. • Presenting the optimal investment decision using a decision tree. • Presenting a solution with social impact that is optimal in terms of stakeholder expectations.	
Practical activites within the subject	Not applicable	

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