GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	DECISION SCIENCES, PG_00061381
Field of study	Engineering Management

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	Polish
Semester of study	6	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment

Conducting unit	Department Of Informatics In Management -> Faculty Of Management And Economics -> Wydziały Politechniki Gdańskiej

Name and surname of lecturer (lecturers)	Subject supervisor	dr Grażyna Musiatowicz-Podbiał
	Teachers	dr Grażyna Musiatowicz-Podbiał

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	7.0	48.0	100

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_K02] makes competent and ethical decisions to create and maintain economic, social and environmental values	makes rational decisions, taking care to maintain the economic, environmental and social values of the organization	[SK5] Assessment of ability to solve problems that arise in practice
	[K6_W01] identifies the determinants of the processes taking place in the analyzed systems and selects methods to solve them using the accumulated knowledge, taking into account the mutual relations between the analyzed phenomena	uses advanced knowledge in decision-making processes, taking into account the interrelations between factors influencing processes in the organization	[SW1] Assessment of factual knowledge

Subject contents	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

Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture test	50.0%	60.0%
	Laboratory report	50.0%	40.0%

Recommended reading	Basic literature	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
	Supplementary literature	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
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	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
Work placement	Not applicable

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