GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	DECISION SCIENCES, PG_00056589
Field of study	Engineering Management

Date of commencement of studies	October 2021	Academic year of realisation of subject	2024/2025
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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	4.0
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 Nina Rizun
	Teachers	dr Nina Rizun

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30	6.0	64.0	100

Subject objectives	The learining objective of the course is to discuss issues related to decision analysis, formulas of rational decision-making based on heuristic, descriptive and simulation methods, in the context of their applications in engineering management.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W13] has a basic knowledge of the design, modelling and optimisation of technical processes and systems	The student is able to conduct systematic analysis and systematic evaluation of decisions made in the field of design, modeling and optimization of processes and technical systems	[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects
	[K6_U08] analyses engineering and managerial solutions in decision-making processes, taking into account pro-quality and pro-environmental aspects, as well as safety of work processes	The student is able to use AI models to solve practical problems to support engineering and management decisions under conditions of certainty, uncertainty and risk.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools

Subject contents	1. Proces podejmowania decyzji. Podejmowanie decyzji a rozwiązywanie problemów2. Modele w procesie decyzyjnym.3. Optymalizacja za pomocą modeli deterministycznych. Budowa modeli decyzyjnych modeleprogramowania liniowego (LP).4. Programowanie liniowe ze zmiennymi całkowitymi i binarnymi.5. Programowanie nieliniowe. Metody sieciowe.6. Modele ewolucyjne i generyczne.7. Teoria gier kooperacyjnych i niekooperacyjnych.8. Heurystyczne metody decyzji i wyboru.9. Decyzje w warunkach niepewności. Decyzje sekwencyjne i drzewa decyzyjne10. Społeczne aspekty podejmowania decyzji.11. Rozwiązywanie złożonych problemów poprzez racjonalizację. Identyfikacja aktorów.12. Konceptualizacja problemu i opracowanie alternatyw.13. Analiza scenariuszy.14. Wielokryterialne podejmowanie decyzji i proces hierarchii analitycznej.15. Podkłady ELECTRE. Model konstrukcyjny podejmowania decyzji.
Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	laboratory	60.0%	60.0%
	exam	60.0%	40.0%

Recommended reading	Basic literature	1. Goodwin P., Wright G.: Decision Analysis for Management Judgment. Wiley 2014. 2. Hillier F. S., Lieberman G. J.: Introduction to Operations Research. Stanford University 2010. 3. Parnell G. S., Driscoll P. J. : Decision Making in Systems Engineering and Management. John Wiley 2011.
	Supplementary literature	1. Bakke D.: The Decision Maker: Unlock the Potential of Everyone in Your Organization, One Decision at a Time Hardcover. Pear Press, 2013 2. Winston W.L.: Operations Research: Applications and Algorithms. Cengage Learning 2003. 3. Patton B. R.: Decision-Making Group Interaction: Achieving Quality. Pearson 2002. 4. Materials attached to eCourse.
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Analysis of the executive study regarding the location and construction of an industrial facility.Simulation regarding the settlement of industrial contracts. Construction of decision rules.Building a knowledge base for HR department employees.

Work placement	Not applicable

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