



Subject card

Subject name and code	DECISION SCIENCES, PG_00056589						
Field of study	Engineering Management						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2023/2024		
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	0.0		0.0	30	
Subject objectives	The learning 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_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		
	[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		
Subject contents	1. Proces podejmowania decyzji. Podejmowanie decyzji a rozwiązywanie problemów2. Modele w procesie decyzyjnym3. Optymalizacja za pomocą modeli deterministycznych. Budowa modeli decyzyjnych modeleprogramowania liniowego (LP)4. Programowanie liniowe ze zmiennymi całkowitymi i binarnymi5. Programowanie nieliniowe. Metody sieciowe6. Modele ewolucyjne i generyczne7. Teoria gier kooperacyjnych i niekooperacyjnych8. Heurystyczne metody decyzji i wyboru9. Decyzje w warunkach niepewności. Decyzje sekwencyjne i drzewa decyzyjne10. Społeczne aspekty podejmowania decyzji11. Rozwiązywanie złożonych problemów poprzez racjonalizację. Identyfikacja aktorów12. Konceptualizacja problemu i opracowanie alternatyw13. Analiza scenariuszy14. Wielokryterialne podejmowanie decyzji i proces hierarchii analitycznej15. Podkłady ELECTRE. Model konstrukcyjny podejmowania decyzji.						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exam	60.0%	40.0%
	laboratory	60.0%	60.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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: Decision sciences / Nauki decyzyjne 2023/2024 - Moodle ID: 34123 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34123	
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		