



## Subject card

Subject name and code	DECISION SCIENCES, PG_00056980						
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	Part-time studies	Mode of delivery			at the university		
Year of study	4	Language of instruction			Polish		
Semester of study	8	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 inż. Bartosz Woliński					
	Teachers	dr inż. Bartosz Woliński					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	8.0	0.0	8.0	0.0	0.0	16
	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	16	0.0		0.0		16
Subject objectives	The teaching goal of the course is to discuss items related to the decision sciences, including: formulas for rational decision-making based on heuristic, descriptive and simulation methods, in the context of their applications in management. An additional goal is to present the basics of artificial intelligence.						
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	Knowledge of descriptive methods. Has extended knowledge in the field decision making and analysis in economics.			[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W13] has a basic knowledge of the design, modelling and optimisation of technical processes and systems	Understands basic problems related to decision-making. Understands the need for systematic analysis and systematic evaluation of decisions made.			[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	1.Introduction to Decision science and Decision analysis. The decision making process and the characteristics of its stages. 2.The decision making and problem solving. Typology of decisions. 3.Decision rules: sequential methods. Rules induction: association rules. 4.Construction of decision trees. Identification of risk factors. 5.Basics of the AHP method. Decision problem analysis using the AHP method. 6.Sensitivity analysis of the solution to the decision problem 7.Building a decision model using the ELECTRE method 8.Typical decision-making problems. Group decision making 9.Decision rules. Barriers to making decisions. Visualization of decisions 10.Unsupervised data mining methods: k-Means clustering, Hierarchical clustering. 11.Supervised data mining methods: Decision tree techniques. 12.Association Rules (Market Basket Analysis). 13.Text analytics and Sentiment analysis. 14.Game theory 15.Data understanding. Data preparation. 16.Data reduction: Principal components analysis. Multidimensional scaling.						
Prerequisites and co-requisites	n/a						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Lecture	60.0%			60.0%		
	Lab	60.0%			40.0%		
Recommended reading	Basic literature	INSEAD papers					
	Supplementary literature	INSEAD papers					

	eResources addresses	Adresy na platformie eNauczanie: Nauki decyzyjne_wyk/lab (NSTACJ. ZI I, sem. 8.)_lato 2023/24. - Moodle ID: 35944 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35944">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35944</a>
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	