GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	DECISION SCIENCES, PG_00056980		
Field of study	Engineering Management		
Date of commencement of studies	October 2019	Academic year of realisation of subject	2022/2023
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 didactic aim of the course is to discuss issues related to decision-making sciences, e.g. formulasrational decision-making based on heuristic, descriptive and simulation methods, win the context of their management applications. An additional goal is to present the basics of artificial intelligence.

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	One understands basic problems related to taking decision One understands the need systematic analysis i systematic evaluation decisions	[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	Knowledge of descriptive methods One has an extensive knowledge in the field making and analyzing decisions in economy	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

1. Introduction to Decision science and Decision analysis. The decision making process and the characteristics of its stages2. The decision making and problem solving. Typology of decisions.3. Construction of decision trees. Identification of risk factors.4. Basics of the AHP method. Decision problem analysis using the AHP method.5. Sensitivity analysis of the solution to the decision problem6. Building a decision model using the ELECTRE method7. Typical decision making problems. Group decision making8. Decision rules. Barriers to making decisions. Visualization of decisions9. Unsupervised data mining methods: k Means clustering , Hierarchical clustering10.Supervised data mining methods: Decision tree techniques.11. Association Rules (Market Basket Analysis)12.Text analytics and Sentiment analysis13.Game theory14.Decision rules: sequential methods. Rules induction: association rules.15.Data understanding. Data preparation.16.Data reduction: Principal components analysis. Multidimensional scaling

<table>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
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<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Laboratory</td><td>50.0%</td><td>40.0%</td></tr>
<tr><td>Lecture</td><td>50.0%</td><td>60.0%</td></tr>
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<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Lecture</td></tr>
<tr><td>Supplementary literature</td><td>n/a</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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