



Subject card

Subject name and code	Decision Support - Structures and Algorithms, PG_00038315						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	February 2026		Academic year of realisation of subject		2026/2027		
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Intelligent and Decision Support Systems -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Robert Piotrowski				
	Teachers		dr hab. inż. Robert Piotrowski				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	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		5.0		25.0	75
Subject objectives	1. To familiarise students with selected forms of decision-making issues. 2. To develop students' skills in formulating and solving single and multi-criteria decision-making issues. 3. For students to master the skills of modelling uncertainty in decision-making issues and considering risks in the decision-making process. 4. To familiarise students with methods of hierarchical solution of decision-making issues.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U10] is able to apply the known mathematical tools and methods and computer techniques to analyse and evaluate automation and robotics components, devices, systems and systems	Solves multi-objective problems with selected methods, e.g. task programming methods.	[SU4] Assessment of ability to use methods and tools
	[K7_W09] has knowledge of typical security systems in industrial settings, knows methods of identification and design of protection systems in accordance with the methodology of functional security, has knowledge of information security	Models uncertainty in decision-making issues.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_U07] is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks and simple research problems in the field of automation and robotics	Solves multi-attribute problems with selected methods, e.g. AHP method.	[SU4] Assessment of ability to use methods and tools
	[K7_W02] has a structured knowledge of the application of information systems to improve the reliability, efficiency, speed and mobility of control and management systems	Defines single and multi-criteria decision-making issues.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_K02] can interact and work in a group assuming various roles and identify priorities for the achievement of a specific task	Performs sub-tasks in a group of several people.	[SK3] Assessment of ability to organize work [SK1] Assessment of group work skills
	[K7_W06] has an extended knowledge of the design of automation components and devices, control and decision support systems control and decision support systems and complex mechatronic systems	Solves single and multi-criteria decision-making problems using selected methods.	[SW3] Assessment of knowledge contained in written work and projects
Subject contents	Course content – lecture Lectures: 1. Course organisation and programme 2. Introduction basic concepts 3. Models of decision-making problems examples 4. Solving multi-objective decision-making problems 5. Solving multi-attribute decision-making problems 6. Decision-making under risk/uncertainty Project: 1. Solving multi-objective decision-making problems Part 1 2. Solving multi-objective decision-making problems Part 2 3. Solving multi-attribute decision-making problems AHP method		
Prerequisites and co-requisites	None		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Colloquium 1	50.0%	35.0%
	Project	50.0%	30.0%
	Colloquium 2	50.0%	35.0%

Recommended reading	Basic literature	1. Trzaskalik T. (2014). Wielokryterialne wspomaganie decyzji. Metody i zastosowania. Polskie Wydawnictwo Ekonomiczne, Warszawa. 2. Prusak A., Stefanów P. (2014). AHP analityczny proces hierarchiczny. Budowa i analiza modeli decyzyjnych krok po kroku. Wydawnictwo C.H. Beck, Warszawa. 3. Bojar W., Rostek K., Knopik L. (2014). Systemy wspomagania decyzji. Polskie Wydawnictwo Ekonomiczne, Warszawa. 4. Nermend K. (2017). Metody analizy wielokryterialnej i wielowymiarowej we wspomaganiu decyzji. Wydawnictwo Naukowe PWN, Warszawa. 5. Gaspars-Wieloch H. (2018). Podejmowanie decyzji w warunkach niepewności. Planowanie scenariuszowe, reguły decyzyjne i wybrane zastosowania ekonomiczne. Wydawnictwo UEP, Poznań.
	Supplementary literature	1. Trzaskalik T. (2024). Wprowadzenie do badań operacyjnych z komputerem. Wydanie III zmienione. Polskie Wydawnictwo Ekonomiczne, Warszawa.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Demonstrate the steps involved in solving a multi-attribute decision problem using the AHP method.	
Practical activities within the subject	Not applicable	

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