



Subject card

Subject name and code	Operational Research, PG_00067669						
Field of study	Management						
Date of commencement of studies	October 2026	Academic year of realisation of subject				2026/2027	
Education level	second-cycle studies	Subject group				Obligatory subject group in the field of study 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	1	Language of instruction				Polish	
Semester of study	2	ECTS credits				4.0	
Learning profile	general academic profile	Assessment form				exam	
Conducting unit	Department of Management Engineering and Quality -> Faculty of Management and Economics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Jolanta Łopatowska				
	Teachers		dr inż. Jolanta Łopatowska				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	20.0	10.0	0.0	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		7.0		48.0	100
Subject objectives	Preparing students to solve complex decision-making problems in organizations by applying optimization methods and operations research tools, based on knowledge of mathematical modeling, network programming, optimization theory, and principles of result interpretation, as well as by shaping attitudes related to responsibility for the quality of analysis and the communication of results, in the context of managerial decision-making in an organizational environment.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_W06] knows and understands the principles of evaluating the reliability of utilized data, applying in-depth specialized knowledge in the field of economic analysis.		Knows and understands the principles of constructing and interpreting optimization models and the sources of data supporting managerial decisions, in the context of applying operations research tools in management.			[SW1] Assessment of factual knowledge	
	[K7_U04] is able to prepare and convincingly present the results of specialized analyses, providing in-depth interpretation during debates and meetings with various audiences.		Is able to apply methods of linear and dynamic optimization, as well as network programming, to the analysis of decision-making problems in an organization.			[SU3] Assessment of ability to use knowledge gained from the subject	
Subject contents	<p>Course content – lecture</p> <p>Basic issues of operations research - essential features and structure of decision-making situations</p> <p>General form of the linear optimization model, interpretation and analysis of the solution</p> <p>Construction of linear optimization models for various optimization problems</p> <p>Graphic method, simplex algorithm</p> <p>Dual linear optimization model</p> <p>Integer optimization model</p> <p>Elements of non-linear programming</p> <p>Multi-criteria models</p> <p>Elements of graph theory</p> <p>Planned network - CPA, CPM, PERT, CCPM methods</p> <p>Ford-Fulkerson algorithm</p> <p>Sequence problem</p> <p>Elements of dynamic programming</p>						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Problem-solving tasks.	60.0%	35.0%
	Project-based tasks.	60.0%	15.0%
	A test with open-ended theoretical questions and true/false questions, as well as problem-solving tasks.	60.0%	50.0%
Recommended reading	Basic literature	Anholcer M. (2023). Badania operacyjne. Poznań, Wyd. UE w Poznaniu. Kukuła K (red.). (2016). Badania operacyjne w przykładach i zadaniach. Warszawa, PWN.	
	Supplementary literature	Ignasiak E. (red.). (2001). Badania operacyjne. Warszawa, PWE. Krawczyk S.(1996). Badania operacyjne dla menedżerów. Wrocław, Wyd. AE we Wrocławiu. Sikora W.(2008). Badania operacyjne. Warszawa, PWE. Zawadzka L.(1996). Metody ilościowe w organizacji i zarządzaniu, cz. I. Gdańsk, Wyd. PG. Zawadzka L. (1997). Metody ilościowe w organizacji i zarządzaniu cz. II. Gdańsk, Wyd. PG.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Solving linear programming models using the simplex method Critical path analysis using the PERT method		
Practical activities within the subject	Not applicable		

Document generated electronically. Does not require a seal or signature.