 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	OPERATIONAL RESEARCH, PG_00058584		
Field of study	Economic Analytics		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
Education level	first-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	Part-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Katedra Inżynierii Zarządzania i Jakości -> Faculty of Management and Economics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Jolanta Łopatowska	
	Teachers		

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	8.0	16.0	0.0	0.0	0.0	24
	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	24	10.0	66.0	100

Subject objectives	Recognizes problems in the organization, formulating quantitative models allowing for making rational decisions.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W05] integrates data from multiple sources to analyze complex economic problems	solves problems using optimization tools, integrating data from many areas of the organization's operation	[SW3] Assessment of knowledge contained in written work and projects
	[K6_U05] designs innovative solutions to complex problems obtaining economic and socially valuable results	selects mathematical models, assessing their usefulness and effectiveness in business practice	[SU4] Assessment of ability to use methods and tools

Subject contents	The basic problems of operations research - the essential features and the structure of the decision situation. The general form of linear optimization model, interpretation and sensitivity analysis of the solution. Construction of linear optimization models - assortment selection model, cutting model, technological process optimization model, transport model, assignment model of mutually replaceable resources. Graphic method, simpleks algorithm. Elements of nonlinear programming. Multi-criteria models. Elements of graph theory. Planned network - CPA, CPM, PERT, CCPM method. Ford-Fulkerson algorithm. Sequential issue. Elements of dynamic programming.

Prerequisites and co-requisites	mathematics

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exam	60.0%	50.0%
	coloquim	60.0%	50.0%

Recommended reading	Basic literature	Kukuła, K. (red.). (2020). Badania operacyjne w przykładach i zadaniach, Warszawa: Wydawnictwo Naukowe PWN. Zawadzka, L. (1996). Metody ilościowe w organizacji i zarządzaniu, cz. 1. Gdańsk: Wydawnictwo Politechniki Gdańskiej. Zawadzka, L. (1997). Metody ilościowe w organizacji i zarządzaniu, cz. 2. Gdańsk: Wydawnictwo Politechniki Gdańskiej. Goldratt, E.M. (2009). Łańcuch krytyczny. MINT Books.
	Supplementary literature	Sikora, W (red.). (2008). Badania operacyjne. Warszawa: PWE. Bernardelli M., Decewicz, A.Tomczyk, E. (2022). Ekonometria i badania operacyjne. Warszawa: Wydawnictwo Naukowe PWN. Gajda, J.B.,Jadczak, R. (2015). Badania operacyjne. Przykłady zastosowań. Łódź: Wydawnictwo Uniwersytetu Łódzkiego. http://www.afe.polsl.pl/index.php/pl/1694/analiza-wrazliwosci-optymalnego-wyboru-asortymentu-produkcji-zakladu-odlewniczego.pdf
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Application of linear programming to build and solve models of decision situations. Critical path analysis using PERT method.	
Work placement	Not applicable	