



Subject card

Subject name and code	OPERATIONAL RESEARCH, PG_00058584						
Field of study	Economic Analytics						
Date of commencement of studies	October 2023	Academic year of realisation of subject				2025/2026	
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	Department of Management Engineering and Quality -> 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] Possesses advanced knowledge of data integration from multiple sources and advanced analytical methods, enabling the analysis of complex economic problems.		solves problems using optimization tools, integrating data from many areas of the organization's operation		[SW1] Assessment of factual knowledge		
	[K6_U05] Designs innovative solutions to challenging problems by applying knowledge from the field of economic analytics, achieving economically and socially valuable outcomes.		selects mathematical models, assessing their usefulness and effectiveness in business practice		[SU4] Assessment of ability to use methods and tools		
Subject contents	<p>The basic problems of operations research - the essential features and the structure of the decision situation.</p> <p>The general form of linear optimization model, interpretation and sensitivity analysis of the solution.</p> <p>Construction of linear optimization models for various types of problems.</p> <p>Graphic method, simpleks algorithm.</p> <p>Dual linear optimization model.</p> <p>The integer numerical optimization model</p> <p>Elements of nonlinear programming.</p> <p>Multi-criteria models.</p> <p>Elements of graph theory.</p> <p>Planned network - CPA, CPM, PERT, CCPM method.</p> <p>Ford-Fulkerson algorithm.</p> <p>Sequential issue.</p> <p>Elements of dynamic programming.</p>						
Prerequisites and co-requisites	mathematics						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	exam		60.0%		50.0%		
	tests		60.0%		50.0%		

Recommended reading	Basic literature	Kukuła, K. (red.). (2020). <i>Badania operacyjne w przykładach i zadaniach</i> , Warszawa: Wydawnictwo Naukowe PWN. Zawadzka, L. (1996). <i>Metody ilościowe w organizacji i zarządzaniu</i> , cz. 1. Gdańsk: Wydawnictwo Politechniki Gdańskiej. Zawadzka, L. (1997). <i>Metody ilościowe w organizacji i zarządzaniu</i> , cz. 2. Gdańsk: Wydawnictwo Politechniki Gdańskiej. Goldratt, E.M. (2009). <i>Łańcuch krytyczny</i> . MINT Books.
	Supplementary literature	Sikora, W (red.). (2008). <i>Badania operacyjne</i> . Warszawa: PWE. Bernardelli M., Decewicz, A.Tomczyk, E. (2022). <i>Ekonometria i badania operacyjne</i> . Warszawa: Wydawnictwo Naukowe PWN. Gajda, J.B.,Jadczyk, R. (2015). <i>Badania operacyjne. Przykłady zastosowań</i> . Łódź: Wydawnictwo Uniwersytetu Łódzkiego. Gruszczyński M., Kuszewski T. , Podgórska M. (red.) (2017). <i>Ekonometria i badania operacyjne</i> . Warszawa: Wydawnictwo Naukowe PWN
	eResources addresses	Adresy na platformie eNauczenie:
Example issues/ example questions/ tasks being completed	Application of linear programming to build and solve models of decision situations. Compare CPA and PERT methods.	
Work placement	Not applicable	

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