GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Operational Research, PG_00068629		
Field of study	Economic Analytics		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2027/2028
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 (on-line)	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 -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor		
	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	6.0	70.0	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 in integrating data from various sources and in methods that enable a comprehensive analysis of economic problems.	demonstrates knowledge of integrating data from various areas of organizational operations and applies optimization tools to solve complex problems	[SW1] Assessment of factual knowledge
[K6_U05] leverages the knowledge acquired in the field of economic analytics to solve challenging problems, achieving results that are economically and socially valuable.	interprets the results of conducted activities in a thorough manner, achieving outcomes that are valuable both economically and socially	[SU3] Assessment of ability to use knowledge gained from the subject

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.
Dual linear optimization model.
The integer numerical optimization model.
Elements of nonlinear programming.
Multi-criteria models.
Elements of graph theory.
CPA, CPM, PERT, CCPM methods.
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%
tests	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. Gruszczyński M., Kuszewski T., Podgórska M. (red.) (2017) Ekonometria i badania operacyjne, Wyd. Naukowe PWN.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Areas of application of linear programming. Critical path analysis using PERT method.	
Work placement	Not applicable	

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