University of Gdańsk

Subject card

Subject name and code	Quantitative Management , PG_00155998		
Field of study	Management		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	postgraduate 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	1	Language of instruction	Polish Polish
Semester of study	1	ECTS credits	4.0
Learning profile	academic	Assessment form	
Conducting unit	Katedra Ekonometrii -> Faculty of Management		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Paweł Miłobędzki	
	Teachers	prof. dr hab. Paweł Miłobędzki	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	14.0	14.0	0.0	0.0	0.0	28

E-learning hours included: 0.0

Additional information:
The lecture will feature multimedia presentations, and the tutorial will involve problem-solving activities.

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	28	23.0	49.0	100

Subject objectives

Developing the ability to analyse decision-making problems in companies, formalise and solve them.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[ZARZMU2_K02] The student is aware of the need to supplement and expand the acquired knowledge and skills and strives to combine knowledge from different fields and disciplines of science interdisciplinarily. The student can inspire others to learn.	The student is aware of the need to expand the acquired knowledge in management and quality sciences and related disciplines in social sciences. This interdisciplinary combination is necessary for formalising and solving models to optimise the allocation of enterprise resources.	[SK1] oral statement/conversation/ discussion
	[ZARZMU2_U06] The student can forecast and simulate complex economic and social phenomena concerning the macro scale (economy) and micro terms (enterprise) using complex methods and tools applied in management and quality studies.	The student can predict fundamental categories reflecting the business's operations and environment.	[SU4] test/exam - oral or written [SU5] implementation of a problem task
	[ZARZMU2_U05] The student can correctly select and apply advanced, complex methods and tools used in management and quality studies.	The student is knowledgeable and capable of utilising specific statistical, econometric, and operational research methods and tools to make optimal decisions about resource allocation under certainty.	[SU4] test/exam - oral or written [SU5] implementation of a problem task
	[ZARZMU2_W13] The student has in-depth knowledge of advanced methods and techniques of managerial analysis, supporting the process of economic decision-making, and is familiar with the sources of obtaining data and information in the various fields of social sciences, especially management and quality studies.	The student is knowledgeable and capable of utilising specific statistical, econometric, and operational research methods and tools to make optimal decisions regarding resource allocation under risk and uncertainty.	[SW4] test/exam - oral or written [SW5] implementation of a problem task
	[ZARZMU2_K05] The student is ready to make an in-depth assessment of phenomena and justify his position through rational, logical and entrepreneurial use of knowledge - basing his assertions and decisions on an in-depth analysis of the information he receives.	The student can thoroughly evaluate the company's decision-making using specific operational research methods and tools and provide a rationale for his/her stance.	[SK4] test/exam - oral or written [SK5] implementation of a problem task
	[ZARZMU2_U07] The student can search for detailed information to make rational and complex decisions of an operational and strategic nature in enterprises.	The student can search, gather, and analyse information about the company and its environment to make optimal decisions on resource allocation across different time horizons.	[SU5] implementation of a problem task
	[ZARZMU2_W01] The student has an expanded knowledge of the social sciences with particular emphasis on the discipline of management and quality sciences and understands their connections with other social sciences.	The student possesses an extensive understanding of management and quality sciences and their interconnections with economics, finance, and operations research.	[SW1] oral statement/ conversation/discussion
	[ZARZMU2_W08] The student has in-depth knowledge of enterprise and entrepreneurship, determinants shaping the effectiveness of economic activity with regional and international aspects.	The student can apply knowledge of the company's operations and environment to specify and solve models for optimising resource allocation.	[SW4] test/exam - oral or written [SW5] implementation of a problem task
	[ZARZMU2_K03] The student is aware of the need to identify critical complex problems, including economic and social ones, and to plan ways to solve them under changing and unpredictable conditions.	The student understands the company's operation under risk and uncertainty and the necessity of considering them when specifying and solving models to optimise resource allocation.	[SK5] implementation of a problem task

<table>
<tr><td>Subject contents</td><td>1. The structure of a decision-making problem, classification of decision-making problems. Decision modelas a formal description of the decision-making problem. Definitions of decision maker, feasible and optimaldecision. The principle of rational action. 2. Forecasting fundamental variables related to the company'soperations and its environment. 3. Linear decision model. Production, diet, blending and cutting problems.Graphical solution. Simplex method. Sensitivity analysis. 4. Transportation problem and its solution.Selected applications. 5. Assignment problem. Hungarian method. Selected applications. 6. Decisions underrisk and uncertainty. Notions of risk and uncertainty. Selection criteria. Selected applications. 7. Gametheory analysis of conflict. Two-person zero-sum games. Saddle point. Randomized strategies. Dominance.Graphical solution. Zero-sum game and linear programming. Selected applications.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Elementary knowledge of mathematics and enterprises' operations.</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Final course assessment - colloqium.</td><td>51.0%</td><td>50.0%</td></tr>
<tr><td>1/2 tests assessing the ability of specyfying decision making problems exhibiting enterprises' operations and solving them.</td><td>51.0%</td><td>50.0%</td></tr>
</table>
</td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Ignasiak, E. (red.) (2001), Badania operacyjne. PWE. 2. Kukuła, K. (red.) (2016), Badania operacyjne w przykładach i zadaniach. Wydawnictwo Naukowe PWN. 3. Trzaskalik, T. (red.) (2008), Wprowadzenie do badań operacyjnych z komputerem. PWE.</td></tr>
<tr><td>Supplementary literature</td><td>-</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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