

Subject card

Subject name and code	Techniques for Optimizing Effectiveness of Enterprises, PG_00117622						
Field of study	Economics						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2026/2027		
Education level	Bachelor's studies	Subject group			Obligatory subject group in the field of study Optional subject group		
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			2.0		
Learning profile	academic	Assessment form			credit		
Conducting unit	Department of Economics and Management of Transportation Companies -> Faculty of Economics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Michał Suchanek				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	8.0	0.0	0.0	0.0	0.0	8
	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	8		2.0		8.0	18
Subject objectives	This course introduces students to the theory, algorithms, and applications of optimization. The optimization methodologies include linear programming, network optimization, integer programming, and decision trees. Applications to logistics, manufacturing, transportation, marketing, project management, and finance.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[EKONL3_W02] has advanced knowledge of the different types of existing business entities and organisations and public institutions	The student understands the diversity of objectives of economic and economic actors in different areas of economics.	[SW4] test/exam - oral or written
	[EKONL3_W01] has in-depth knowledge of the nature of social sciences, their place in the system of sciences, knows the role of economic sciences in this system and uses universal economic terminology	The student understands the importance of decisions at the individual level for the organization as a whole. Understands the vagaries and sensitivities of decisions fraught with behavioral constraints.	[SW4] test/exam - oral or written
	[EKONL3_K01] recognises the importance of economic knowledge in identifying and solving economic problems and of consulting experts when difficulties in solving them independently	The student is able to use optimization theory to formulate and solve practical decision-making problems. Knows how to use literature sources to differentiate subclasses of problems	[SK4] test/exam - oral or written
	[EKONL3_K05] correctly identifies, diagnoses and resolves professional dilemmas and different options for solutions	The student is able to formulate linear and non-linear decision-making problems in the areas of enterprise	[SK4] test/exam - oral or written
	[EKONL3_W04] knows the types of economic and social ties and the regularities governing them	The student understands the ties between the various departments of the enterprise.	[SW4] test/exam - oral or written
	[EKONL3_W05] has advanced knowledge of man as a subject who creates social structures and the principles of their functioning and of his action in these structures, knows well the motives of human economic decision-making	The student understands the differences between the purpose functions of individual employees, departments and the organization as a whole.	[SW4] test/exam - oral or written
	[EKONL3_K04] is willing to think and act in an entrepreneurial manner; adapts to new situations and conditions, takes on the challenges of creative thinking, is resilient in the face of failure, is able to identify risks and assess the risks of failure	The student is able to aggregate business problems into formal language, identify the objectives, constraints and sensitivity of solutions to decision-making problems	[SK4] test/exam - oral or written
	[EKONL3_U08] has the ability to observe, understand and analyse economic and social phenomena and processes using appropriate scientific methods	The student knows how to simplify complex economic phenomena into solvable problems using optimization techniques	[SU4] test/exam - oral or written
	[EKONL3_W03] has advanced knowledge of the relations between economic agents and social organisations operating in the national, international and intercultural arenas	The student understands the impact of actors in the economic environment of the enterprise on the functions of the organization's purpose and its departments.	[SW4] test/exam - oral or written
	[EKONL3_U02] is able to use the knowledge of theory and data to analyse concrete economic and social processes and phenomena and to analyse these phenomena using methods developed in economics, finance and management sciences	The student is able to combine theoretical knowledge with enterprise data and integrate information streams into formal decision-making problems.	[SU4] test/exam - oral or written
	[EKONL3_W07] has advanced knowledge of the basic economic and financial principles of the functioning and management of economic entities and organisations as well as the legal, organisational, moral and ethical norms and rules governing the functioning of public institutions	The student understands the functions of the purpose of the various subsystems of enterprises and the rules that determine their formulation.	[SW4] test/exam - oral or written
	[EKONL3_U01] can correctly interpret economic and social phenomena and apply knowledge of economics, finance and management sciences to explain economic phenomena	The student knows how to simplify complex economic phenomena into solvable problems using optimization techniques	[SU4] test/exam - oral or written

	Course outcome	Subject outcome	Method of verification
	[EKONL3_U06] uses the knowledge acquired in economics, finance and management to solve economic and social dilemmas arising in the professional context	The student understands the importance of optimization techniques in solving practical decision-making problems.	[SU4] test/exam - oral or written
Subject contents	Linear Programming Theory and Applications Integer Programming Theory Network Flows and Heuristics Decision Trees Behavioral Economics		
Prerequisites and co-requisites	The student should understand the diversity of business and economic entities. He should understand the role of enterprise information systems as sources of information in the formulation and solution of decision-making problems. The course uses knowledge and skills derived from mathematics, statistics and accounting.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written exam	51.0%	100.0%
Recommended reading	Basic literature	<p>Makuch, M. A. (2012). Decyzje podmiotów gospodarczych w ujęciu ekonomii behawioralnej. <i>Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania Uniwersytetu Szczecińskiego</i>, 27.</p> <p>Zaleśkiewicz, T. (2011). <i>Psychologia ekonomiczna</i>. Warszawa: Wydawnictwo Naukowe PWN.</p> <p>Godłów-Legiędź, J. (2013). Ekonomia behawioralna: od koncepcji racjonalności do wizji ustroju ekonomicznego. <i>Ekonomia</i>, (25), 24-41.</p> <p>Łańcuchowska, M. (2013). Podejmowanie decyzji w warunkach ryzyka. In <i>Finanse, rachunkowość i zarządzanie Polska, Europa, Świat 2020</i>; Wydawnictwo Uniwersytetu Łódzkiego.</p>	
	Supplementary literature	<p>Wornalkiewicz, W. (2023). Implementacja procedury optymalizacji usług logistycznych. <i>Zeszyty Naukowe Wyższej Szkoły Technicznej w Katowicach</i>, 16.</p> <p>Kociemba, D. (2020). Możliwości wykorzystania dodatku Solver w celu optymalizacji zadań logistycznych-studium przypadków. <i>Przedsiębiorczość i Zarządzanie</i>, 21(4), 133-148.</p> <p>Waśniewski, J., & Strumiłło, J. (2022). Uwarunkowania digitalizacji usług zdrowotnych. Wydawnictwo Uniwersytetu Gdańskiego.</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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