Course title	Managerial Decisions in Logistics		ECTS code	14.3.EE.SZ.3572
			ECTS credits	2

Name of unit administrating study	KL	Field of study	Economics	Field of specialisation	L&M;

Teaching staff	Leszek Reszka, Associate Professor

Number of hours

Lectures	0	Classes	0	Tutorials	0	Laboratory	30	Seminars	0	Language classes	0

Forma aktywności			Year&Type of studies*	2 SS2,
Hours with the participation of the academic teacher (including office hours, exams, others):			Semester:	3,
Hours without the participation of the academic teacher (student's self-study, homeworks):			Type of course:	obligatory
Total number of hours:		0	Language of instruction:	English

Teaching form	in-class learning
Teaching methods	Activating methods in training classes, Work in computer laboratories, Lectures including multimodal presentations, Case studies, Collaborating, group activities,

Prerequisites (required courses and introductory requirements)

Required courses	Logistics and Mobility Modelling
Introductory requirements	Basic logistics knowledge

Assessment method, forms and criteria

Assessment method	Course completion (graded)
Assessment criteria	Student's work during the course is observed on an ongoing basis by the teacher, and constitutes, in addition to the project and the test, the basis for the final mark of the course. The project concerns the use of the presented methods of decision support optimization in logistics for a company.

Course objectives

The aim of the course is to familiarize students with methods of decision-making support used in logistics and to acquire practical skills in their use.

Learning outcomes

Knowledge	E2_W06	Student knows methods and tools of modelling logistics decision-making situations.
	E2_W08	Student has deepened knowledge of logistics processes in enterprises.

Verification of learning outcomes - Knowledge

Outcomes	written exam	oral exam	test	essay/paper /portfolio	tasks/ homeworks	individual presentation	group presentation	classroom activities	classroom discussion	individual project	group project
E2_W06			X					X			X
E2_W08			X					X			X

Skills	E2_U04	The student is able to model complex logistics processes with the use of methods and quantitative tools created by the economic sciences.
	E2_U13	The student is able to cooperate and work in a team, taking various roles in it, including a leading role.

Verification of learning outcomes - Skills

Outcomes	written exam	oral exam	test	essay/paper /portfolio	tasks/ homeworks	individual presentation	group presentation	classroom activities	classroom discussion	individual project	group project
E2_U04								X			
E2_U13								X			X

Attitudes	E2_K03	The student inspires and organizes the preparation of economic projects.

Verification of learning outcomes - Attitudes

Outcomes	written exam	oral exam	test	essay/paper /portfolio	tasks/ homeworks	individual presentation	group presentation	classroom activities	classroom discussion	individual project	group project
E2_K03											X

Course contents

1. Managerial decision-making process in logistics

- Areas of managerial decision-making in logistics
- Optimization versus sub-optimization
- Decision-making process in a company
- Models in a company
- Types of models
- Examples of models
- Decision models
- Components of a decision model
- Stages of decision model building
- Example of an optimization model construction

2. Theory of linear programming

- Features of linear programming models
- Construction of a logistics optimization model
- The algorithm of using the SOLVER tool
- Possibilities of using the SOLVER tool

3. Examples of linear programming models

- Optimal selection of the product range
- Linear programming in integers
- Other possible constraints in linear programming
- The mixture problem
- Graphical method for solving a linear programming model
- Duality in linear programming
- The transportation model
- Balanced and unbalanced transportation problem
- The blocked road problem in a transportation problem
- Transshipment model
- Assignment problem

6. The theory of network programming

- Selected concepts of graph theory
- Graphical illustration of a graph

7. Examples of network programming models

- Transportation model with transshipments

- Shortest route model
- Equipment exchange model
- Maximum flow model

Recommended reading lists

Obligatory readings:

- A. Yalaoui, Hi.Chehade, F. Yalaoui, L. Amodeo: Optimization of Logistics (ISTE), Kindle Edition 2013
- S. G.Powell, K. R.Bake: Management Science: The Art of Modeling with Spreadsheets, John Wiley and Sons, 2010
- G. J. Plenert: Supply Chain Optimization through Segmentation and Analytics (Resource Management), CRC Press, 2014
- G. D.Eppen, F. J.Gould, C. P.Schmidt, J. H.Moore, L. R.Weatherford: Introductory Management Science Decision Modelling with Spreadsheets. Prentice Hall, New Jersey 1998.

Facultative readings:

- L. Reszka: Decision Making Process in the Management of Logistics Support System [in:] C. Mańkowski, L. Reszka (ed.): Modelowanie procesów i systemów logistycznych, cz. XXII Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2021, s. 167-176
- L.Reszka: Multicriteria optimization methods in logistics on the example of warehouse location, "Journal of Positive Management", vol. 9, nr 3/2018, Toruń 2018, ISSN: 2083-103X, p. 3-16
- L. Reszka: The Applicability of the Simos' Method to Determination of Weights In Optimal Multicriteria Decision Making in Logistics [W:] M. Chaberek, L. Reszka (ed.): Modelling of Logistics Processes and Systems, part XVII Research Journal of the University of Gdańsk Transport Economics and Logistics vol. 66. Gdańsk University Press, Gdańsk 2017, ISSN: 2544-3224, e-ISSN 2544-3232, p. 81-88

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* SS1- undergraduate studies   * SS2 - graduate studies   * SDang - doctoral studies
** MSG - International Economic Relations