

# Card of Course

Description of course	
Code of course	TR.SPoORI
Name of course	Selected problems of Operations Research I
Version of course	2024/2025
<b>A. Place of the course in system of studies</b>	
Level of education	Intermediate
Form and mode of studies	Lecture
Field of studies	Transport
Profile of studies	General academic profile
Specialisation	Main field
Place of teaching of course	Faculty of Transport
Place of realization of course	Department of Air Transport Engineering
Coordinator of course	Professor Anna Stelmach, Ph.D., D. Sc.
<b>B. General characteristic of the course</b>	
Block of courses	Main field
Group of courses	General
Level of course	Intermediate
Status of course	Faculty with limited choice
Language of course	English
Nominal semester	-
Academic year	2024/2025
Preliminary requirements	-
☐ Limit of students	-
<b>C. Effects of education and manner of teaching</b>	
Purpose of course	To give the knowledge and basic skills to perform specific tasks in the field of techniques analysis and of air traffic control: measurements of traffic parameter, measurements of air traffic control parameters, sector capacity, control of the aircraft streams flow.
Effects of education	See Table 1.
Form of didactic studies and number of hours	
Lecture	15
Exercise type of course	
Laboratory	
Project type of course	
Contents of education	Introduction to problems and mastering of basic knowledge about implementing selected algorithms of operational research in transport area
Methods of evaluation	Students independently perform tasks. The task will be reviewed taking into account the correctness of their implementation.
Methods of verification of effects of education	See Table 1.
Exam	No
Literature	[1] Handbooks in Operations Research and

	Management Science: Transportation, vo. 14, Cynthia Barnhart; Gilbert Laporte (Eds.); Barnhart, Cynthia (editor); Laporte, Gilbert (editor), 2006.
	[2] Mathematics and Operations Research. Part VII, Gawinecki Jerzy, 2007.
	[3] Graph Theory, Daniel A. Marcus, 2011.
	[4] Graph Theory: Colourings, Independence and Domination (CID), Ewa Drgas-Burchardt (Red.), 2017.
	[5] Graph Theory, Jose M. Rodriguez, 2018.
Website of the course	-
<b>D. Student's activity</b>	
Number of credits ECTS	3
Number of hours of student's job for achievement of education's effect (description):	60 hours - 15 h. lectures, 10 h. study of the literature, 25 h. solve exercises, 10 h. consultations
Number of credits ECTS on the course with direct participation of academic teacher	1
Number of credits ECTS on practical activities on the course	2
<b>E. Additional information</b>	
Notes	
Date of last edition	September 11 <sup>st</sup> , 2024

**Table 1. General academic profile**

Course's effects		Field effects	Area effect
<b>Knowledge</b>			
Effect:	1) The student has ordered knowledge of mathematical analysis. 2) The student knows the principles of construction and use of mathematical models supporting decision-making processes (using graph theory) and the issue of Transport.	Tr1A_W01	T1A_W01
Code of effect:	W_01		
Verification:	Forming evaluation: independent execution of tasks.		
<b>Skills</b>			
Effect:	1) The students can obtain information from the literature, databases, and patent information and other reliable sources. 2) The student is able to integrate the information, make their interpretation, and to draw conclusions and formulate and justify opinions.	Tr1A_U01	T1A_U01
Code of effect:	U_01		
Verification:	Forming evaluation: independent interpretation of the results of optimization tasks.		
<b>Social competences</b>			
Effect:	Students can work in a group, taking the different roles.	Tr1A_K03	T1A_K03
Code of effect:	K_01		
Verification:	Forming evaluation: a common solution to the decision-making using known methods.		

Approved by

June Skelton