



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Organization of refrigerated transport

### Course

Field of study

Year/Semester

Transport

1/3

Area of study (specialization)

Profile of study

Refrigerated transport

general academic

Level of study

Course offered in

Second-cycle studies

polish

Form of study

Requirements

full-time

elective

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

15

15

0

Tutorials

Projects/seminars

0

0

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

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### Prerequisites

Knowledge: student has basic knowledge in the field of mathematics, operational research and transport and management

Skills: student is able to integrate the obtained information, make their interpretation, draw conclusions, formulate and justify the opinions of the ability to see, match and interpret phenomena

Social competencies: the student is aware of the importance and non-technical understanding (including in particular economic and social) aspects and effects of transport activities and decisions

### Course objective

Preparing students to manage transport using quantitative tools (methods of optimization and decision support), allowing rational and effective management of the functioning of transport and logistics systems



## Course-related learning outcomes

### Knowledge

1. knows advanced methods, techniques and tools used to solve complex engineering tasks and conduct research in a selected area of transport
2. has advanced and in-depth knowledge in the field of transport engineering, theoretical foundations, tools and means used to solve simple engineering problems
3. knows the economic, legal and other conditions of transport companies
4. has basic knowledge of management / running a business and individual entrepreneurship

### Skills

1. can use analytical, simulation and experimental methods to formulate and solve engineering tasks and simple research problems
2. can assess the usefulness and the possibility of using new achievements (methods and tools) and new products of transport technology
3. can communicate in English and Polish using various techniques in the professional environment, and other environments, including the use of terminology concerning transport engineering

### Social competences

1. understands the importance of using the latest knowledge in the field of transport engineering in solving research and practical problems
2. understands that in the field of transport engineering, knowledge and skills quickly become obsolete

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Presence and activity during classes

Laboratory classes: presentation of the results of solved case studies

## Programme content

1. Concepts of "optimization" and "decision support": Introduction to optimization and decision support (definitions, interpretations) - multi-criteria in decision making - the essence of compromise solutions
2. Single-criterion optimization: Rules for creating mathematical models of decision problems, the use of optimization tools, calculation procedures
3. The notion of the do-or-buy problem: Definitions and the essence of do-or-buy problems in transport / logistics enterprises (own or foreign logistics, own or foreign transport)
4. "do" option - fleet replacement planning
5. Multicriteria decision aid: Definitions and the essence of multicriteria decision aid (MCDA), classifications of methods; rules for creating mathematical models; selection of MCDA methods; rules for creating the decision-maker's preferences; "buy" option - selection and evaluation of the carrier;
6. Determining the fleet composition: Definitions of the problem of determining the fleet composition in a transport / logistics company; the essence of the problem and its specificity; elements influencing the fleet composition in the enterprise
7. Supply chain integration strategy in eGrocery and FMCG: Direct Store Delivery, Efficient Consumer Response - ECR, basic elements, application effects, EDI, EDIFACT, GS1, EFT, ABC analysis, results



control.

8. Freight forwarding in refrigerated transport - definitions: forwarding, forwarder, classification of forwarding and forwarding agents, basic legal acts related to forwarding: forwarding contract, General Conditions of Forwarding

9. Choice of international delivery method - case study

10. Resource allocation problem - case study

### Teaching methods

Lecturing, demonstrating, collaborating

### Bibliography

Basic

1. Madej B., Michniak J., Madej R., Kurcz J.: Przewozy artykułów żywnościowych. Biblioteka Akademii Transportu i Przedsiębiorczości, Warszawa 2014
2. Sikora W. (red.): Badania operacyjne. Polskie Wydawnictwo Ekonomiczne, Warszawa 2008
3. Jędrzejczak Z., Kukła K., Skrzypek J., Walkosz A.: Badania operacyjne w przykładach i zadaniach. Wydawnictwo Naukowe PWN, Warszawa 2005
4. Murphy P.R. jr, Wood D.F.: Nowoczesna Logistyka. HELION, Gliwice, 2011
5. Coyle J., Bardi E., Langley C.: Zarządzanie logistyczne. PWE, Warszawa, 2010
6. Neider J.: Transport międzynarodowy. PWE, Warszawa 2015

Additional

1. Figueira J., Greco S., Ehrgott M. (eds.): Multiple Criteria Decision Analysis. State of the Art. Surveys. Springer, New York 2016
2. Hillier F., Lieberman G.: Introduction to Operations Research. McGraw Hill Publishing, New York 2002
3. Jacyna M.: Modelowanie wielokryterialne w zastosowaniu do oceny systemów transportowych. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2001

### Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (-) <sup>1</sup>	30	1,0

<sup>1</sup> delete or add other activities as appropriate