



Państwowa Wyższa Szkoła Zawodowa
im. H. Cegielskiego w Gnieźnie

**Institute of Management and
Transport**

Name of modules	Code
Operational research	

COURSE DESCRIPTION CARD		
Field of study: Transport	Training profile (general academic/practical): practical	Course (obligatory/optional): obligatory
Specialization: Logistics and transport technology	Subject offered in: Polish	ECTS 2
Cycle of studies: first	Field of studies: technical sciences	
Status of subject in curriculum (basic, specialized, other)		
Status of subject in curriculum (basic, specialized, other) basic	(general academic, from other department) general academic	
Lecturer in charge of the subject: Unit providing the training: Institute of Management and Transport mgr Magdalena Ziętek-Koczan e-mail: mgdzietek@gmail.com		
Initial requirements in knowledge, skills, social competences:		
1	Knowledge:	Basic knowledge of modern information technology, the theory of IT and mathematics.
2	Skills:	The ability to use MS Office programs (especially MS Excel) in terms of basic functionality.
3	Social competences:	The ability to use a computer to exchange information with other people.
The aim of the subject: Acquaint with the basics of information systems applicable to modern transport systems. Students learn the basics of modern information systems used in transport. Then they become familiar with the theoretical and practical aspects of the using information systems in various fields of transport. The course combines the		
Training outcomes		
Knowledge: As a result of the training course a student is able to:		Reference to field-related training
1	Student has a basic knowledge of physics, mathematics, and operational research and econometrics	T1P_W01

2	Student defines and recreates basic rights and dependencies in the field of micro- and macroeconomics. He understands how the economy works.	T1P_W04, T1P_W08, T1P_W11, InzP_W03
3	Student has basic knowledge necessary to understand non-technical conditions of engineering activities. Formulates the basic principles of work safety regulations applicable in the design of transport systems.	T1P_W08 T1P_W11 InzP_W03
Skills: As a result of the training course a student is able to:		Reference to field-related training
1	Student acquires information from domestic and foreign literature, databases and other sources. Analyzes the obtained information, interprets and synthesizes it.	T1P_U01 T1P_U02
2	Student uses basic computer text editors, spreadsheets and databases	T1P_U02 T1P_U07 InzP_U02
3	Student uses the acquired mathematical theories to create and analyze simple models of transport and logistics systems	T1P_U09 InzP_U02
4	Student operates selected IT systems used in transport.	T1P_U07 InzP_U02
Competences: As a result of the training course a student is able to:		Reference to field-related training outcomes
1	Student is aware of the need for continuous training, understands the social role of a technical university graduate.	T1P_K01 T1P_K07 InzP_K01
2	Student is aware of the responsibility for his own work and ready to comply with the principles of cooperation in the team and takes responsibility for the implemented tasks.	T1P_K02 InzP_K01
3	Student correctly identifies and prudently solves dilemmas related to the profession.	T1P_K05
Assumed grading methods		
Lectures: Written / oral test		
<u>Classes / laboratories: Checking and rewarding the increase of knowledge based on the tasks carried out during the exercises</u>		
Program content		

Linear programming - defining a mathematical model, a geometric method, a dual task, simplex. Transport issue - open, closed, two-stage. The issue of the broker. Transport and production problem with non-linear function of costs. The traveling salesman problem. Sorting tasks.

Main bibliography:

1. B. Guzik, red., Ekonometria i badania operacyjne. Zagadnienia podstawowe, Wydawnictwo Akademii Ekonomicznej w Poznaniu, Poznań 2003
2. M. Anholcer, H. Gaspars, A. Owczarkowski, Przykłady i zadania z badań operacyjnych i ekonometrii, Wydawnictwo Akademii Ekonomicznej w Poznaniu, Poznań 2005
3. Trzaskalik T., Wprowadzenie do badań operacyjnych z komputerem, Polskie Wydawnictwo Ekonomiczne, Warszawa 2003

Supplementary bibliography:

1. Pamuła T., Król A., Badania operacyjne w przykładach z rozwiązaniami w Excelu, Wydawnictwo Politechniki Śląskiej, Gliwice 2013

Student's involvement

Studies	full-time studies		part-time study	
	hours	ECTS	hours	ECTS
Total number of hours	50	2	50	2
Hours requiring direct contact with a lecturer	35	2	35	2
Practical classes	15	1	15	1
Activities requiring self-studying	15	0	15	0