

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Decision problems in logistics I</b>		Code <b>1010615311010617928</b>
Field of study <b>Transport</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>1 / 1</b>
Elective path/specialty <b>Logistics of Transport</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>Second-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: <b>18</b> Classes: <b>-</b> Laboratory: <b>9</b> Project/seminars: <b>-</b>		No. of credits <b>4</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b>		ECTS distribution (number and %) <b>4 100%</b>
<b>Responsible for subject / lecturer:</b> dr inż. Paweł Zmuda-Trzebiatowski email: pawel.zmuda-trzebiatowski@put.poznan.pl tel. 616652716 Faculty of Transport Engineering ul. Piotrowo 3 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	student has basic knowledge in the field of mathematics, operational research and transport and management
2	<b>Skills</b>	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
3	<b>Social competencies</b>	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
<b>Assumptions and objectives of the course:</b> 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		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b> 1. knows advanced methods, techniques and tools used to solve complex engineering tasks and conduct research in a selected area of transport - [T2A_W06] 2. has advanced and in-depth knowledge in the field of transport engineering, theoretical foundations, tools and means used to solve simple engineering problems - [T2A_W01]		
<b>Skills:</b> 1. can use analytical, simulation and experimental methods to formulate and solve engineering tasks and simple research problems - [T2A_U04] 2. can assess the usefulness and the possibility of using new achievements (methods and tools) and new products of transport technology - [T2A_U06]		
<b>Social competencies:</b> 1. understands the importance of using the latest knowledge in the field of transport engineering in solving research and practical problems - [T2A_K02]		
<b>Assessment methods of study outcomes</b>		
Lectures: written summary test (open or multiple choice questions).		
Laboratory: presentation of the results of solved case studies.		

<b>Course description</b>		
<p>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</p> <p>2. Monocriterial optimization: Rules for creating mathematical models of decision problems, the use of optimization tools, calculation procedures</p> <p>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)</p> <p>3. 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</p> <p>4. Multi-criteria optimization: The essence of multi-criteria optimization, efficient (pareto-optimal) solutions to the decision problem, techniques of searching for solutions that are efficient</p> <p>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;</p> <p>6. "do" option - fleet replacement planning</p> <p>7. Vehicle routing problem</p>		
<b>Basic bibliography:</b>		
<p>1. Figueira J., Greco S., Ehrgott M. (eds.): Multiple Criteria Decision Analysis. State of the Art. Surveys. Springer, New York 2005</p> <p>2. Hillier F., Lieberman G.: Introduction to Operations Research. McGraw Hill Publishing, New York 2002</p> <p>3. Sikora W. (red.): Badania operacyjne. Polskie Wydawnictwo Ekonomiczne, Warszawa 2008</p>		
<b>Additional bibliography:</b>		
<p>1. Jędrzejczak Z., Kukła K., Skrzypek J., Walkosz A.: Badania operacyjne w przykładach i zadaniach. Wydawnictwo Naukowe PWN, Warszawa 2005</p> <p>2. Jacyna M.: Modelowanie wielokryterialne w zastosowaniu do oceny systemów transportowych. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2001</p>		
<b>Result of average student's workload</b>		
Activity	Time (working hours)	
1. Participation in classes (according to plan)	27	
2. Consolidation of knowledge / report	39	
3. Consultations	8	
4. Preparation for the exam	24	
5. Participation in the exam	2	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	100	4
Contact hours	55	2
Practical activities	53	2