

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Modeling of Transportation Systems and Processes</b>		Code <b>1010615311010612254</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>Road 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>9</b> Laboratory: <b>-</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> <b>Technical sciences</b>		ECTS distribution (number and %) <b>4 100%</b> <b>4 100%</b>
<b>Responsible for subject / lecturer:</b> dr inż. Marcin Kiciński email: marcin.kicinski[at]put.poznan.pl tel. 61 665 21 29 Wydział Inżynierii Transportu ul. Piotrowo 3 60-965 Poznań		<b>Responsible for subject / lecturer:</b> dr inż. Maciej Bieńczyk email: maciej.bieniczak[at]put.poznan.pl tel. 61 665 27 16 Wydział Inżynierii Transportu ul. Piotrowo 3 60-965 Poznań
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	The student has a basic knowledge of the transport problem modelling and optimization.
2	<b>Skills</b>	The student is able to integrate the information obtained, make their interpretation, draw conclusions, formulate justify opinions
3	<b>Social competencies</b>	Student is able to cooperate in a group, taking the different roles. Student is able to to set priorities important to solve given tasks. The student demonstrates self-reliance in solving problems, acquiring and improving his knowledge and skills.
<b>Assumptions and objectives of the course:</b> Acquiring of the knowledge about modelling of transportation processes and systems and skills needed to perform a different models of transportation systems and processes.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Has the knowledge of the basic concepts of different types transport and preceses models - [T2A_W02]		
2. Has the knowledge of the different methods, techniques modelling of the transport and preceses problems - [T2A_W06]		
<b>Skills:</b>		
1. Can acquire information from literature, databases and other sources (in Polish and English), integrate them, make their interpretation and critical evaluation, draw conclusions and formulate and justify opinions - [T2A_U01]		
2. Can plan and carry out experiments, including measurements and simulations, interpret the results obtained and draw conclusions and formulate and verify hypotheses related to complex engineering problems and simple research problems - [T2A_U03]		
3. Can use analytical, simulation and experimental methods to formulate and solve engineering tasks and simple research problems - [T2A_U04]		
<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]		
2. Understands the importance of popularizing activities regarding the latest achievements in the field of transport engineering - [T2A_K03]		

<b>Assessment methods of study outcomes</b>		
Lectures - assessment of the student activity during lectures and exam, classes - evaluation of the exercises		
<b>Course description</b>		
Introduction to modelling of transport processes and systems, types of models, modelling in various towns (Poland / world), demand models (FSM, ABM, LM); model of supply (transportation networks, models for public transport), modal split (model calibration, individual and public transport), forecast, transportation studies, traffic simulation, software (tools) for the modelling and traffic simulation.		
<b>Basic bibliography:</b>		
1. Hensher D.A., Button K., J. (red).: Handbook of Transport Modelling. Elsevier, Oxford, 2008		
2. Jacyna M.: Wybrane zagadnienia modelowania systemów transportowych. Wydawnictwo: Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2009		
3. Leszczyński J.: Modelowanie systemów i procesów transportowych. Wydawnictwo: Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 1999.		
4. Ortuzar J., Willumsen L.G.: Modelling Transport. John Wiley & Sons, New York, 2011		
5. Malarski M.: Inżynieria ruchu lotniczego Wydawnictwo: Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2006		
<b>Additional bibliography:</b>		
1. Sivakumar A.: Modelling Transport: A Synthesis of Transport Modelling Methodologies, Imperial College, London 2007.		
2. Skorupski J.: Współczesne problemy inżynierii ruchu lotniczego. Modele i metody. Wydawnictwo: Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2014		
<b>Result of average student's workload</b>		
Activity	Time (working hours)	
1. Participation in the lecture and classes	27	
2. Preparation for classes	5	
3. Consolidation of the lecture and classes	20	
4. Consultations	2	
5. Consolidation of content of the classes and lecture	20	
6. Participation in the exam	2	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	76	4
Contact hours	31	2
Practical activities	0	0