STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Modeling of Transportation Systems and Processes**		Code **1010622211010612254**
Field of study **Transport**	Profile of study (general academic, practical) **(brak)**	Year /Semester **1 / 1**
Elective path/specialty **Ecology of Transport**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **2** Classes: **1** Laboratory: **1** Project/seminars: **-**		No. of credits **4**
Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**	
Education areas and fields of science and art **technical sciences**		ECTS distribution (number and %) **4 100%**

Responsible for subject / lecturer:

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Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	The student has a basic general knowledge: processes, modelling, systems and relationships. The student knows and understands a basic general methods and practical tools in the field of transportation processes and systems. The student knows the main task of systems, such as: transport and logistics companies
2	**Skills**	The student is able to use the concepts and methods in the description of processes and systems. Students can use their knowledge to analyze transport systems and processes. Student is able to identify specific problems in transportation systems
3	**Social competencies**	Student is able to do a literature research and knows the rules of work group and discussion. The student has self-reliance in solving problems

Assumptions and objectives of the course:

-Acquiring of the knowledge about modelling of transport processes and systems and skills needed to perform a traffic and different models of transportation systems

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Has a detailed knowledge of the transport systems modeling, models of transport systems, the distribution of streams in transport networks, transportation system environment, forecasting the development of transport systems, the dynamics of transport processes - [K2A_W10]

2. Has a structured, theoretically founded knowledge in the field of transport economics: economic importance and functions of transport - the location of production and settlement, elements of microeconomics, the costs of transport and their structure, the economic balance in the transport, the nature and function of the transport market, transport policy - [K2A_W11]

Skills:

1. Is able to obtain information from the literature, internet, databases and other sources in Polish and English. Can integrate the information to interpret and learn from them, create and justify opinions - [K2A_U01]

2. Is able to communicate using a variety of techniques in a professional environment and other environments using the formal record of the design, technical drawings, concepts and definitions in the scope of the study area - [K2A_U02]

3. Has the ability to self-educate using modern teaching tools such as remote lectures, webpages and databases, educational software, electronic editions - [K2A_U06]

Social competencies:

1. Understands the need and knows the possibilities of lifelong learning, knows the need for acquiring new knowledge for professional development - [K2A_K01]
2. Is aware of and understands the importance and impact of non-technical aspects of mechanical engineering activities and its impact on the environment and responsibility for own decisions in short and long-term aspect - [K2A_K02]
3. Is able to identify and resolve the dilemmas associated with the profession, among others problems at the technology/environment level - [K2A_K06]

Assessment methods of study outcomes
-Colloquium/exam
Course description
-Introduction to modelling of transport processes and systems, traffic 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.
Basic bibliography:
1. Hensher D.A., Button K., J. (eds.).: Handbook of Transport Modelling. Elsevier, Oxford, 2007
2. Jacyna M.: Wybrane zagadnienia modelowania systemów transportowych, Oficyna Wydawnicza Politechniki Warszawskiej, 2009.
3. Ortuzar J., Willumsen L.G.: Modelling Transport. John Wiley & Sons, New York, 2011
Additional bibliography:
1. Leszczyński J.: Modelowanie systemów i procesów transportowych, Oficyna wydawnicza. Politechniki Warszawskiej, 1999
2. Sivakumar A.: Modelling Transport: A Synthesis of Transport Modelling Methodologies, Imperial College, London 2007.

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	30
2. Learning of lectures content	5
3. Consultations	3
4. Preparation for the exam	3
5. Participation in the exam	3
6. Preparation for classes	8
7. Participation in classes	15
8. Learning of the classes conten	8
9. Preparation for laboratory	4
10. Participationin laboratory	15
11. Learning of the laboratory conten	4
12. Participation in the final evaluation	8

Student's workload

Source of workload	hours	ECTS
Total workload	106	4
Contact hours	66	2
Practical activities	40	2