

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Control and Management in Transport Systems		Code 1010615311010612215
Field of study Transport	Profile of study (general academic, practical) general academic	Year /Semester 1 / 1
Elective path/specialty Road Transport	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 9 Classes: 9 Laboratory: - Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: Marek Maciejewski email: marek.maciejewski@put.poznan.pl tel. 616652226 Faculty of Transport Engineering ul. Piotrowo 3, 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of higher-level mathematics and general theory of systems. Different features and characteristics of transport systems: aims and forms of their implementation, means of transport, infrastructure, organization.
2	Skills	Mathematical methods of modelling, their algorithmization and numerical simulation. Practical bases of programming.
3	Social competencies	Cooperation and teamwork. Defining the priorities and hierarchy of tasks in the pursuing aims of a student group. Correct identification of problems and the approach to the resolution of problems. Responsibility.
Assumptions and objectives of the course: Diversity and specificity of transport systems. The rules of law. Technical equipment, mathematical methods and software supporting management of transport systems. Similarities and differences in the management of various transport systems. Practical aspects of traffic control and supervision in transport systems. Development perspectives and limitations.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Knows the purposes and principles of management, monitoring and steering the transport systems - [K2A_W20, K2A_W10]		
2. Knows methods of the road traffic control - [K2A_W22]		
3. Knows methods of the air traffic control - [K2A_W22]		
4. Knows methods of the rail traffic control - [K2A_W22]		
5. Knows methods of the maritime and inland waterway traffic control - [K2A_W22]		
6. Knows legislation in the area of the traffic flow control - [K2A_W20]		
Skills:		
1. Is familiar with basic methods for solution of steering problems - [K2A_U18]		
2. Sees the traffic control in transportation as a component of larger systems - [K2A_U16]		
3. Is able to use the selected methods and tools in traffic control - [K2A_U17]		
4. Is able to benefit from selected computer control systems - [K2A_U07]		
5. Is able to present the transport steering problems as an IT problems - [K2A_U18]		
Social competencies:		

1. Is able to collaborate in a group in resolving the problems of traffic control - [K2A_K04]
2. Is able to define priorities in the problems of traffic control - [K2A_K05]
3. Understands the need of systematic work for achieving the traffic control projects - [K2A_K01]
4. Understands that traffic problems should be presented and solved as the IT problems - [K2A_K05]

Assessment methods of study outcomes		
Lectures: written examination of lecture materials		
Exercises: individual reports from performed traffic analyses		
Course description		
<p>Definitions of traffic control and management. Purpose, scope and methods of traffic control.</p> <p>Modeling and simulation of road traffic. The impact of traffic control on its flow in macroscopic and microscopic terms. The effect of various factors. Hybrid simulation, control and supervision systems in urban and motorway traffic. Coordination of traffic lights. Basic legal regulations for road traffic.</p> <p>Civil and state aviation. Classifications: airports, air carriers and airspace. ICAO. IATA. Aviation law. Air traffic management: goals and functions. Air traffic flow management. Airspace management. Air traffic services. Model classifications, and simulations of air traffic.</p> <p>Features of rail transport. Rail networks and their classification. Traffic safety. Regulations. Railway traffic control system. Traffic control devices. Rules of transport and organization of traffic. Timetables.</p> <p>Ship register. Classification of ships. Irregular (non-scheduled) and linear shipping. Passenger and ferry shipping. Chartering. Agreement. Bill of lading. Models of maritime traffic. Features of inland transport. Classifications of waterways and ports. The vessel characteristics. Modeling of inland traffic.</p>		
Basic bibliography:		
1. Guca S., Suchorzewski W., Tracz M., Inżynieria ruchu drogowego, teoria i praktyka, Warszawa, WKiŁ 2008 / 2014		
2. Szczuraszek T. (ed.), Bezpieczeństwo ruchu miejskiego, Warszawa, WKiŁ 2008		
3. Basiewicz T., Gołaszewski A., Rudziński L., Infrastruktura transportu, Warszawa, OWPW 2007		
Additional bibliography:		
1. Malarski M., Inżynieria ruchu lotniczego, Warszawa, OWPW 2006		
2. Bogdaniuk B., Massel A., Podstawy transportu kolejowego, Gdańsk, WPG 1999		
3. Kujawa J. (red.), Organizacja i technika transportu morskiego, Gdańsk, WUG 2001		
4. Wojewódzka-Król K., Rolbiecki R., Rydzkowski W., Transport wodny śródlądowy, Gdańsk, WUG 2007		
Result of average student's workload		
Activity	Time (working hours)	
1. Preparation for classes	9	
2. Participation in classes (according to plan)	18	
3. Consolidation of the content of classes / report	9	
4. Consultations	2	
5. Preparation for the exam / pass	18	
6. Participation in the exam / pass	1	
Student's workload		
Source of workload	hours	ECTS
Total workload	48	2
Contact hours	21	1
Practical activities	18	1