STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Control and Management in Transportation**		Code **1010612211010612215**
Field of study **Transport**	Profile of study (general academic, practical) **(brak)**	Year /Semester **1 / 1**
Elective path/specialty **Railway 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: **1** Classes: **1** Laboratory: **-** Project/seminars: **-**		No. of credits **2**
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		ECTS distribution (number and %)

Responsible for subject / lecturer:

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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 specific characteristics of transport systems. Technical equipment, mathematical methods and software supporting management of the means of transport. Similarities and differences in management of various transport systems. The use of the latest technological and IT developments. Variable approaches in steering processes. Practical aspects of control and monitoring in transport systems.

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
Definitions of the steering (or control) and management, with a reference to the transport systems and traffic flow. Fundamental traffic parameters. The purpose, scope and methods of traffic control. Modelling and simulation of road traffic. The impact of traffic control on their flow in macroscopic and microscopic terms. Visualization of the various factors effect. Hybrid systems od the simulation, control and monitoring in the local urban or motorway traffic. Coordination of the traffic lights. Basic legal arrangements in the sphere of road traffic. The civil and state aviation. The classifications: airports, air carriers, and the airspace. ICAO. IATA. The aviation law. The air traffic management: objectives and functions. The air traffic flow management. The airspace management. Air traffic services: the tasks and their division. Classification of models and the air traffic simulations. Specificities of the rail transport. The railway network: its elements (rail lines and nodes, stations and posts) and their classification. The rail safety. Legislation. Control command and signalling system for the rail transport, and its elements. Traffic at rail stations and posts. The traffic control devices. Rules for the carriage and the traffic organization. Timetables. Maritime transport and traffic. The maritime register. Ship classification. The liner and non-scheduled shipping. The passenger and ferry shipping. Chartering. Contracts. Bill of lading. Models for the maritime traffic. Simulations. Inland waterway transport and traffic. Classification of waterways and ports. The vessel characteristics. The inland waterway traffic modelling. Rules of inland traffic simulation.
Basic bibliography:
Additional bibliography:

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	15
2. Lecture consultations	1
3. Preparing for the egzam	8
4. Admission to the egzamination	1
5. Participation in classes	15
6. Class exercise consultations	1
7. Preparing for the credit	1
8. Admission to credit tests	0

Student's workload

Source of workload	hours	ECTS
Total workload	42	2
Contact hours	33	2
Practical activities	0	0