COURSE DESCRIPTION CARD - SYLLABUS

Course name
Basics of Traffic Engineering [S1Trans1>PIR]

Course

Field of study
Transport

Year/Semester
2/4

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
15

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge of the construction of means of transport (motor vehicles and rail vehicles, planes and ships), typical forms of infrastructure and traffic regulations. Fundamentals of probability theory and statistics. Methods of measuring physical quantities. General principles of modeling processes that vary in time. Spreadsheet support. Collaboration and group work. Defining priorities and hierarchy of tasks in the group"s goals. Correct identification of problems and approach to solving dilemmas. Responsibility.

Course objective

Basic concepts of traffic engineering. Drivers, vehicles and road infrastructure. Measurements, studies and analyzes of road traffic. Basics of traffic modeling and simulation. Road capacity. Transport policy. Traffic control. Priorities in transport. Parking. Traffic safety and environmental protection.

Course-related learning outcomes

Knowledge:
The student has extended and in-depth knowledge of physics useful for formulating and solving selected technical tasks, in particular for correct modeling of real problems
The student has knowledge of important development trends and the most important technical

achievements and of other related scientific disciplines, in particular transport engineering

Skills:
The student can properly use information and communication techniques, applicable at various stages of the implementation of transport projects
The student is able, when formulating and solving tasks in the field of transport, to apply appropriately selected methods, including analytical, simulation or experimental methods
The student is able to assess the computational complexity of algorithms and transport problems
The student has the ability to formulate tasks in the field of transport engineering and their implementation using at least one of the popular tools

Social competences:
The student can think and act in an entrepreneurial way, incl. finding commercial applications for the created system, taking into account not only business benefits, but also social benefits of the conducted activity
The student correctly identifies and solves dilemmas related to the profession of a transport engineer

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Lectures: written test on the lecture material. Classes: individual reports on the conducted measurements and road traffic tests.

Programme content

Purpose, scope and methods of traffic engineering. Basic parameters of movement: intensity, density and speed. Road and traffic conditions, and road capacity. System: human - vehicle - road. Features of road users and factors influencing human behavior. Vehicle characteristics. Road infrastructure. Road traffic research objectives. Types of measurements and tests. Measurement methods and their registration. Development of measurement results, their analysis and visualization. Traffic modeling. Traffic simulation. General classification of models. Characteristics of the basic models. Introduction to numerical simulations. Road capacity. The level of service for road traffic. Determination of road capacity. Capacity of right-of-way intersections, roundabouts, and traffic lights. Strategies for the development of transport and traffic. Instruments for transport policy implementation. Traffic management (goals, means and methods). Traffic control. Traffic lights: purpose of use and justification for the installation. Advantages and disadvantages. Public transport: privileges, priorities and their effects (economic, social and environmental). Methods and means of privileging. Parking (types, organization and control). Traffic safety status: accident registration and statistics, factors, analyzes and assessments. Transport ecology.

Course topics

none

Teaching methods

1. Lecture: multimedia presentation. 2. Exercises: carrying out various tasks in the field of traffic measurements and processing the results.

Bibliography

Basic
1. Guca S., Suchorzewski W., Tracz M., Inżynieria ruchu drogowego, teoria i praktyka, Warszawa, WKiŁ 2008 / 2014
2. Gajda J, Sroka R., Stencel M., Żegleń T., Burnos P., Piwowar P., Pomiary parametrów ruchu drogowego, Kraków, Wydawnictwa AGH 2012
Additional
1. Komar Z., Wolek C., Inżynieria ruchu drogowego - wybrane zagadnienia, Wrocław, WPW 1994
2. Szczuraszek T. (ed.), Bezpieczeństwo ruchu miejskiego, Warszawa, WKiŁ 2008

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00