COURSE DESCRIPTION CARD - SYLLABUS

Course name

Traffic engineering and optimization

Course

Field of study

Transport

Year/Semester

1/2

Area of study (specialization)

Sustainable Transport

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

English

Form of study

full-time

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

0

Tutorials

15

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr inż. Szymon Fierek

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Faculty of Civil and Transport Engineering

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Students have elementary knowledge about transport systems, principles of planning, operating and management.

Student can solve particular problems occurring in transport systems using optimization and simulation methods.

Student can cooperate in a group and define priorities important for solving appointed problems.

Course objective

The main goal of the subject is to get students acquainted with theoretical and practical problems occurred in transportation systems, as well as methods to solve these problems

Course-related learning outcomes

Knowledge

Student has advanced and in-depth knowledge of transport engineering, theoretical background, tools and means used to solve simple engineering problems

Student has a structured and theoretically founded general knowledge related to key issues in the field of transport engineering

Skills

Student is able to plan and carry out experiments, including surveys and simulations, interpret the obtained results and draw conclusions, as well as formulate and verify hypotheses related to complex engineering problems and simple research problems

Student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks and simple research problems

Social competences

Student understands the importance of using the latest knowledge in the field of transport engineering in solving research and practical problems

Student understands the importance of popularizing the latest achievements in the field of transport engineering

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written test

Assessment of assignments

Programme content

Parameters of road traffic (vehicles and pedestrians) and parking.

Fundamental Principles of Traffic Flow, fundamental diagram.

Methods of analyzing the capacity and traffic conditions in relation to road sections, intersections and road junctions.

Methods and means of organizing the traffic of vehicles (including means of public transport), cyclists and pedestrians;

Basic concepts of modeling.

Traffic models on sections of roads and intersections.

Introduction to microscopic simulation using PTV Vissim software.

Data collection - traffic surveys.

Scenario management.

Teaching methods

Lecturing, Classroom discussion, Project-Organized Problem-Based Learning, Case studies.

Bibliography

Basic

1. Barcelo J.: Fundamentals of Traffic Simulation. Springer-Verlag, New York, 2010

2. Hall R.W. (ed.): Handbook of Transportation Science. Kluwer Academic Publishers, New York, 2003

3. Kutz M.(ed): Handbook Of Transportation Engineering, McGraw-Hill, 2011

Additional

1. Barcelo J.: Fundametals of Traffic Simulation

2. Ortuzar J., Willumsen L.G.: Modelling Transport. John Wiley & Sons, New York, 2001

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies; preparation for lectures, laboratory classes and project; preparation for exam and final presentation of the project) [1]	30	1,0

[1] delete or add other activities as appropriate