



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Modeling and simulation of traffic pt. 2

### Course

Field of study

Year/Semester

Transport

4/7

Area of study (specialization)

Profile of study

Road transport

general academic

Level of study

Course offered in

First-cycle studies

Polish

Form of study

Requirements

full-time

elective

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

15

30

0

Tutorials

Projects/seminars

0

0

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

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### Prerequisites

Knows the basic issues related to road traffic engineering

Can analyze data

He can work in a team

### Course objective

Understanding the principles of microsimulation modeling

Construction of simulation models of intersections

### Course-related learning outcomes

Knowledge

The student has an ordered, theoretically founded general knowledge of technology, transport systems and various means of transport



The student knows the basic techniques, methods and tools used in the process of solving tasks in the field of transport, mainly of an engineering nature engineering

The student has knowledge of ethical codes regarding transport engineering, is aware of the dangers related to environmental protection and understands the specificity of mission-critical systems

#### Skills

The student is able to obtain information from various sources, including literature and databases (both in Polish and in English), integrate it properly, interpret it and critically evaluate it, draw conclusions, and comprehensively justify his/her opinion.

The student can properly use information and communication techniques, applicable at various stages of the implementation of transport projects

The student is able to properly plan and conduct perform experiments, including measurements and computer simulations, interpret the obtained results, and correctly draw conclusions

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 - in accordance with the given specification - to design (create a model of a fragment of reality), formulate a functional specification in the form of use cases, formulate non-functional requirements for selected quality characteristics) and implement a device or a widely understood system in the field of means of transport, using appropriate methods, techniques and tools

#### Social competences

The student is aware of the importance of knowledge in solving engineering problems, knows examples and understands the causes of malfunctioning transport systems, which led to serious financial and social losses, or to serious loss of health and even life,

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Final test

Individual or group project

#### Programme content

Introduction to microsimulation modeling, Microsimulation programs - presentation of the most popular tools with an overview of their functionality; Presentation of the essence of the microsimulation approach and organization of the modeling process. General overview of the process of building a microsimulation model; List of data for building simulation models; Drivers' behavior model; Presentation of sample program applications; Getting to know the PTV Vissim software

#### Teaching methods

Informative lecture (conventional), Conversation lecture,



Laboratory (experiment) method (students independently conduct experiments)

Project method (individual or team implementation of a large, multi-stage cognitive or practical task, the effect of which is the creation of a work)

### Bibliography

#### Basic

1. Gaca S., Suchorzewski W., Tracz M.: INŻNIERIA RUCHU DROGOWEGO TEORIA I PRAKTYKA. Wydawnictwa Komunikacji i łączności WKł 2014
2. Ortuzar J., Willumsen L.G.: *Modelling Transport*. John Wiley & Sons, New York, 2001

#### Additional

1. Hensher D.A., Button K.J. (red.): *Handbook of Transport Modelling*. Elsevier, Oxford, 2000

### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4
Classes requiring direct contact with the teacher	45	2
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	55	2

<sup>1</sup> delete or add other activities as appropriate