POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Modeling and simulation of traffic pt. 2 [N1Trans1>MiSR2]

Course

Field of study	Year/Semester
Transport	4/7
Area of study (specialization)	Profile of study
–	general academic
Level of study	Course offered in
first-cycle	Polish
Form of study	Requirements
part-time	elective

Number of hours

Lecture	Laboratory classes	Other
9	18	0
Tutorials	Projects/seminars	
0	0	

Number of credit points

4,00

Coordinators

dr inż. Szymon Fierek
szymon.fierek@put.poznan.pl

Lecturers

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:

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

Course topics

1) Introduction to modeling, microscopic models
2) Fundamental traffic diagram, car following model, lane change models
3) Sources and methods of data collecting for model construction
4) Pedestrian traffic modeling
5) Macroscopic modeling - idea and basic assumptions, 4-stadium modeling
6) Activity models,
7) Multi-agent modeling
8) Basic elements of the microscopic model in PTV Vissim
- car following model,
- lane change models
- pedestrian movement, pedestrian crossings, stairs, elevators, obstacles
- traffic lights
- mass transportation
- scenario management

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	90	4,00
Classes requiring direct contact with the teacher	27	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	63	3,00