POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Transportation system management [S2Bud1E-IPB>ZST]

Course

Field of study	Year/Semester
Civil Engineering	1/2
Area of study (specialization)	Profile of study
Construction Engineering and Management	general academic
Level of study	Course offered in
second-cycle	English
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other
15	0	0
Tutorials	Projects/seminars	
0	15	

Number of credit points

2,00

Coordinators

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

Lecturers

Prerequisites

Students have elementary knowledge about transport systems, principles of planning, operating and management. Student can solve particular problems occurring in transport systems using 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:
- have detailed knowledge in the field of operation algorithms of selected software supporting the analysis and design of building facilities, which are also useful to plan and manage construction projects, including Building Information Modelling (BIM)
- know in detail the principles of analysing, constructing and dimensioning elements and connections in selected building structures.

Skills:
- utilizing the obtained knowledge, they can select appropriate (analytical, numerical, simulation, experimental) methods and tools to solve technical problems;
- use advanced specialized tools in order to search for useful information, communication and in order to obtain software supporting the designer and organizer of building engineering works.

Social competences:
- can realize that it is necessary to improve professional and personal competence; are ready to critically evaluate the knowledge and received content;
- understand the need to transfer to the society the knowledge about building engineering, transfer the knowledge in a clear and easily comprehensible manner.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written test
Assessment of assignments

Programme content

Transport modeling and traffic simulation is such as:
- Basic concepts of transport modeling.
- Four stage approach.
- Fundamental Principles of Traffic Flow, fundamental diagram.
- Introduction to microscopic simulation using PTV Vissim software.
- Data collection - traffic surveys.
- Scenario management.

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

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

Additional:
1. Meyer M.D.: Transportation Planning Handbook. John Wiley & Sons, Hoboken, 2016

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	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)	30	1,00