COURSE DESCRIPTION CARD - SYLLABUS

Course name
Transport demand modeling [S2TIIZM1E>MPwT]

Course

Field of study
Information Technology for Smart and Sustainable Mobility

Year/Semester
2/3

Area of study (specialization)
–

Profile of study
general academic

Level of study
second-cycle

Course offered in
English

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

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

Lecturers

Prerequisites

Basic knowledge of geographical information systems, spreadsheet oparation, basic statistics

Course objective

To provide students with knowledge, basic methods and techniques in the field of demand modelling and traffic forecasting.

Course-related learning outcomes

Knowledge:
The student possesses advanced and in-depth knowledge in the field of transport engineering, including theoretical foundations, tools, and means used to solve basic engineering problems, particularly in travel generation modeling, spatial distribution modeling, mode choice modeling, traffic assignment to the network, and model calibration
The student has well-structured and theoretically grounded general knowledge related to key issues in the field of transport engineering, especially in travel modeling and traffic forecasting

Skills:
The student is able to plan and conduct experiments and computer simulations related to transport demand modeling, interpret the obtained results, draw conclusions, and formulate and verify hypotheses connected with complex traffic planning problems
The student is able to use information and communication technologies applied in transport demand modeling.
The student can - according to a given specification that includes non-technical aspects - design and implement a traffic model - at least partially - using appropriate methods, techniques, and tools.

Social competences:
The student understands the importance of using the latest knowledge in transport engineering to solve research and practical problems

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written exam
Oral exam
Assesment of assignments - practical work
Evaluation of the project carried out during the semester

Programme content

Demand segmentation based on travel behaviour patterns, the links between the different stages of demand model building, the consequences of certain assumptions in demand model building and their impact on the level of accuracy of the model calculation results.

Course topics

Introduction to demand modelling
Modelling trip generation
Modelling the spatial distribution of journeys
Modelling the distribution of transport tasks
Distribution of traffic over the network
Calibration of models
Traffic forecasting

Teaching methods

Interactive lectures using multimedia presentations
Case studies and practical examples. Group and individual work.

Bibliography

Basic:
Ortuzar J., Willumsen L.G.: Modelling Transport, 5th edition. John Wiley & Sons, New York, 2024
Yaron Hollander: Transport Modelling for a Complete Beginner. CTthink, 2016

Additional:
Hensher D.A., Button K.J. (red).: Handbook of Transport Modelling. Elsevier, Oxford, 2000
Mannering F.L., Washburn S.: Principles of Highway Engineering and Traffic Analysis, 7th Edition. John Wiley & Sons, New York, 2019

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00