GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Modelling and Optimisation in Transport, PG_00057088		
Field of study	Transport and Logistics		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2022/2023
Education level	second-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Zakład Energetyki i Automatyki Morskiej -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jerzy Kowalski	
	Teachers	dr inż. Klaudia Wrzask	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	15.0	0.0	45

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	45	9.0	21.0	75

Subject objectives

Acquiring general knowledge in the field of modeling and computer simulations used in transportation

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W01] The student has an extended and deepened knowledge of some areas of mathematics, used to formulate, solve and verify complex problems in transport	is able to formulate and verify complex problems in transport in terms of mathematics	[SW3] Assessment of knowledge contained in written work and projects
[K7_U04] The student is able to use the known methods and mathematical models, as well as computer simulations to analyze, design and evaluate the functioning of transport systems or their components	analyzes and evaluates the functioning of transport systems or their elements	[SU2] Assessment of ability to analyse information
[K7_W03] The student has extensive knowledge of: reliability and safety of transport systems and environmental protection in transport	knows how to determine the parameters of reliability and safety of transport systems and environmental protection in transport	[SW3] Assessment of knowledge contained in written work and projects
[K7_W02] The student has an extensive knowledge of modeling transport processes, including the knowledge necessary to describe and evaluate the functioning of selected elements of the transport system	knows the principles of the transport processes modeling	[SW1] Assessment of factual knowledge

Subject contents	Transport - basic issues, classification, directions of transport development in the EU and Poland,Modeling - classification, model construction and their complexity, adequacy of models and their validation, simulation of phenomena, analysis of modeling results,Optimization - Optimization and polyoptimization problem, data sets and functions, objective functions, classification, optimization methods,Modeling in transport - modeling of infrastructure, traffic modeling,Optimization in transport - the traveling salesman problem, the problem of routing.
Prerequisites and co-requisites	overall knowledge in the field of transport systems

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	60.0%	50.0%
	60.0%	50.0%

Recommended reading

Basic literature	Transport Modelling for a Complete Beginner, Yaron Hollander, CTthink!, 2016,
Supplementary literature	Modeling of Transport Demand - Analyzing, Calculating, and Forecasting Transport Demandby V. A Profillidis, G. N.Botzoris, Elsevier Science 2018
eResources addresses	Adresy na platformie eNauczanie: Modelowanie i Optymalizacja w Transporcie, Transport i Logistyka, lato, 2022/2023 - Moodle ID: 29128 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29128

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable