GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Ecological aspects in transport development, PG_00062451						
Field of study	Transport						
Date of commencement of studies	February 2025		Academic year of realisation of subject	2025/2026			
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery	at the university			
Year of study	2		Language of instruction	Polish			
Semester of study	3		ECTS credits	3.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Department of Transportation Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. arch. Romanika Okraszewska					
	Teachers						

Lesson types

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

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 4008 Ekologiczne Aspekty w Rozwoju Transportu
https://enauczanie.pg.edu.pl/2025/course/view.php?id=4008

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	5.0	25.0	75

Subject objectives

The aim of the subject Ecological aspects in the development of transport is to understand and analyze the impact of transport on the natural environment and the relationship with ongoing climate change. The subject discusses global and local actions to combat climate change.

1. Understanding the impact of transport on the environment

Transport is one of the main sources of greenhouse gas emissions and air pollution. Students learn about the negative impact of transport on the environment, including air, water and soil pollution, landscape, as well as noise and vibrations generated by vehicles.

1. Learning about ecological solutions in transport

Students learn about various ecological solutions in transport, such as electric vehicles, international transport of goods by rail, or autonomous technologies. Innovations in ecological transport are also discussed, such as the use of solar energy to power vehicles.

1. Understanding the importance of ecologistics in transport

Ecological logistics in transport are actions taken by companies from the TSL sector to reduce the negative impact of logistics on the natural environment. Students learn about the importance of sustainable transport development, which involves using available resources in the most optimal way possible, maximizing the efficiency of logistics operations.

1. Analysis of the benefits of ecological solutions in transport

Students analyze the benefits of implementing ecological solutions in transport, such as reducing CO2 emissions, saving fuel and maintenance costs, as well as image benefits for companies

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W02] explains the importance and interdependence of key components describing transport systems and processes and their environment, using in-depth knowledge in accordance with the main trends in the development of scientific disciplines related to the field of study	The student has in-depth knowledge about possible actions to limit the negative effects of transport on the environment.	[SW2] Assessment of knowledge contained in presentation
[K7_U01] creates innovative solutions to complex and unstructured problems, taking into account the variability of the environment by synthesizing information from many sources, using analytical, simulation and experimental methods	The student is able to assess the strength of the negative impact on the environment and propose actions to limit the negative impact.	[SU4] Assessment of ability to use methods and tools
[K7_K02] makes competent and ethical decisions, caring for the public interest and maintaining economic, social and environmental values	The student is able to use appropriate methods to determine the impact of an institution/facility/ area/event on the environment and propose actions to limit the adverse impact.	[SK5] Assessment of ability to solve problems that arise in practice

Subject contents

Course content – lecture

1. Background of ecological problems from transport
2. Global actions to combat climate change
3. Carbon footprint management
4. Promotion of alternative forms of transport
5. Adaptation and mitigation of climate change in transport
6. Solutions reducing transport emissions in the city
7. Electromobility
8. Efficient use of resources
9. Innovative technologies
10. Protection of biodiversity
11. Noise reduction
12. Sustainable spatial planning
13. Mobility management
14. Promoting eco-driving

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Project	60.0%	25.0%
laboratory	60.0%	25.0%
Lecture	60.0%	50.0%

Recommended reading

Basic literature

1. Dennis Meadows, Donella Meadows, Jørgen Randers, William W. Behrens III, Granice Wzrostu, 1972
2. *Bińczyk E., Epoka człowieka. Retoryka i marazm antropocenu, Warszawa: PWN, 2018*
3. *J.D. Guillo, Parlament Europejski, Dyrekcja Generalna ds. Komunikacji, Bruksela 2023*
4. *Materials of working group III contribution to the IPCC Fourth Assessment report, 2007*
5. Gresheim Smith, Experiental design and way finding, 2022
6. *Adaptation of transport to climate change in Europe, Challenges and options across transport modes and stakeholders, Report, European Environment Agency, No8/2014*
7. *IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*
8. *Johannes Buberger, Anton Kersten, Manuel Kuder, Richard Eckerle, Thomas Weyh, Torbjörn Thiringer, Total CO2-equivalent life-cycle emissions from commercially available passenger cars, Renewable and Sustainable Energy Reviews, Volume 159, 2022*

	Supplementary literature	1. W. R. Smith, Product differentiation and market segmentation as alternative marketing strategies, J. Mark., vol. 21, no. 1. 2. S. Haustein and M. Hunecke, Identifying target groups for environmentally sustainable transport: assessment of different segmentation approaches, Curr. Opin. Environ. Sustain., vol. 5, no. 2, pp. 197204, Jun. 2013. 3. I. Salomon and M. Ben-Akiva, The use of the life-style concept in travel demand models, Environ. Plan. A, vol. 15, pp. 623638, 1983. 4. D. A. Hensher, Market segmentation as a mechanism in allowing for variability of traveller behaviour, Transportation (Amst)., vol. 5, pp. 257284, 1976. 5. G. Beirão and J. A. Sarsfield Cabral, Understanding attitudes towards public transport and private car: A qualitative study, Transp. Policy, vol. 14, no. 6, pp. 478489, 2007.
	eResources addresses	Basic https://www.teraz-srodowisko.pl/media/pdf/aktualnosci/264-transport-climate-change-in-Europe.pdf - Adaptation of transport to climate change in Europe, Challenges and options across transport modes and stakeholders, Report, European Environment Agency, No8/2014 Supplementary https://www.eea.europa.eu/en - The European Environment Agency (EEA) is an agency of the European Union and provides valuable insights on the state of Europe's environment. Thanks to reliable data collected from our extensive network, we actively support Europe's environment and climate policies. https://www.gov.pl/web/infrastruktura/wr-d - 303 / 5 000 Website of the Ministry of Infrastructure with recommended guidelines for roads, intended for use at every stage of the road life cycle, i.e. planning, design, execution of construction works (renovation, reconstruction, extension, construction, reconstruction and demolition), as well as road maintenance. Prześlij opinię Dostępne są tłumaczenia
Example issues/ example questions/ tasks being completed	1. Compare CO2 emissions for individual means of transport (plane, train, combustion engine car, electric car, bicycle) over an analogous distance and in analogous conditions. 2. What determines the amount of CO2 emissions from motor vehicles? 3. What is mitigation, and what is its significance in the context of climate change? 4. Provide examples of adaptation to climate change in transport.	
Practical activites within the subject	Not applicable	

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