GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Environmental Protection in Transport, PG_00064524						
Field of study	Transport						
Date of commencement of studies	October 2024		Academic year of realisation of subject	2026/2027			
Education level	first-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	3		Language of instruction	Polish			
Semester of study	5		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	30.0	15.0	0.0	0.0	0.0	45
	E-learning hours included: 0.0						
	eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=7481						
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	Familiarizing the student with definitions related to transport, the environmental impact of transport, and environmental protection. Familiarizing the student with the types of environmental impacts caused by transport systems and methods for preventing them. Developing skills in gathering environmental data, conducting measurements, forecasting selected physical parameters related to the environmental impact of transport, interpreting information, and drawing conclusions.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K02] understands the need to formulate and communicate to the public information and opinions on the achievements of environmental engineering and other aspects of work of a sanitary industry engineer; is aware of the importance of and understands non-technical aspects and consequences of engineering; takes steps to communicate such information and opinions in a comprehensible manner and present different points of view	The student is aware of the significance of Environmental Impact Assessments in the investment life cycle.	[SK2] Assessment of progress of work
[K6_W06] has knowledge to understand transportation development planning considering economic, spatial, ecological, and social conditions and the consequences of transportation activities	Possesses in-depth knowledge regarding the environmental impact of transport activities, including the mechanisms behind pollution generation (exhaust emissions, noise, vibration, and water and soil contamination) and their ecological and social consequences. Is familiar with the national and EU legal frameworks and environmental standards required to assess and plan the sustainable development of transport systems from both spatial and economic perspectives.	[SW2] Assessment of knowledge contained in presentation
[K6_U07] able to identify the influence of management mechanisms, technological progress, spatial policy, environmental protection, and safety on the functioning and development of transportation and to incorporate it into the process of planning, designing, construction, and operation of transportation infrastructure and systems.	The student is able to identify the impact of economic management mechanisms, technological progress, spatial policy, environmental protection, and safety on the functioning and development of transport, and to take this impact into account during the planning, design, construction, and operation of transport modes and systems.	[SU2] Assessment of ability to analyse information

Subject contents

Course content – lecture

Parameterization of impacts; measurement, forecasting, and simulation techniques; data sources. Characteristics of impacts and prevention methods: noise and vibration, emissions of environmentally harmful substances, water and soil pollution, landscape degradation and land use by transport infrastructure and vehicles, transport accidents, transport of hazardous materials. New technologies and innovations for environmental protection in transport. EIA and SEA: procedures, content, legal basis, and project life cycle. Monitoring of environmental conditions and impacts. Social and societal consequences of transport. Impact of environmental pollution on human health. Global threats associated with transport.

Course content – exercises

Noise measurements from various transport subsystems. Comparative analysis of the obtained values against data from noise maps, design documentation, and reference values. Proposals for mitigation measures. Noise intensity calculations at specific points. Forecasting the quantity and quality of stormwater runoff from paved road surfaces. Environmental impact assessment using the Leopold matrix. Calculation of average daily exhaust emission concentrations at a specified distance from the road.

Prerequisites and co-requisites

Assessment methods and criteria

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

Recommended reading

Basic literature

- Brzeżański, M., & Gos, Z. (1999). Toksyczność spalin silników spalinowych. Wydawnictwa Komunikacji i Łączności (WKŁ).
- Gronowicz, J. (2003). Ochrona środowiska w transporcie lądowym. Instytut Technologii Eksploatacji. Stańczak-Strząska, M. (2007). Ochrona środowiska w transporcie. Wybrane zagadnienia. Wydawnictwo Politechniki Krakowskiej.
- Ustawa z dnia 3 października 2008 r. o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz.U. 2008 nr 199 poz. 1227 z późn. zm.).

	Supplementary literature	• Rodrigue, J.-P. (2020). The Geography of Transport Systems (5th ed.). Routledge. • Sheate, W. R. (1994). Environmental Impact Assessment: A Guide to Procedures. Chapman & Hall. • Batog, J., Batog, S., & Szczerbowski, R. (red.). (2020–2023). Opracowania z zakresu zrównoważonego rozwoju transportu oraz polityki transportowej Unii Europejskiej (w tym wybrane raporty nt. pakietu Fit for 55 w transporcie). • Instytut Ochrony Środowiska – Państwowy Instytut Badawczy (IOŚ-PIB). Raporty roczne dotyczące emisji zanieczyszczeń z sektora transportowego i jakości powietrza w Polsce.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Determination of noise levels (actual, planned, and permissible) for a selected location. 2. Explain the concept of a sustainable development strategy and provide one or more examples of its implementation regarding environmental protection in transport. 3. Harmful environmental impacts of transport – list the types of impacts and briefly characterize them. 4. Environmental protection during the road investment planning stage – list and briefly characterize the issues requiring special attention.	
Practical activites within the subject	Not applicable	

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