



Subject card

Subject name and code	, PG_00072751						
Field of study	Civil Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2026/2027		
Education level	first-cycle studies		Subject group		Optional subject group		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	4		Language of instruction		Polish		
Semester of study	7		ECTS credits		5.0		
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. Jacek Alenowicz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	30.0	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=7619						
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		0.0		0.0	45
Subject objectives	Getting knowledge on technical solutions, materials and technologies, which allow minimizing unfavorable impact of road construction on the natural environment.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_K04] Engages in independent lifelong learning and individually follows the development of science and technology in the field of civil engineering.		Student understands necessity of constant and active deepening of knowledge regarding development of technical solutions, materials and technologies minimizing unfavourable impact of road construction on the natural environment		[SK5] Assessment of ability to solve problems that arise in practice		
	[K6_K03] Can effectively, clearly and unambiguously convey information, describe activities and communicate their results/ outcomes to engineers or a wider audience using appropriate communication methods and tools.		Student describes results of work and conveys information within the scope of the subject matter with use of appropriate methods and tools.		[SK4] Assessment of communication skills, including language correctness [SK2] Assessment of progress of work		
Subject contents	Course content – lecture						
	Influence of technical, material and technological solutions used in road construction on the natural environment. Possibilities of new materials use reduction. Recycling of asphalt and PCC pavements. Use of alternative materials. Energy consumption and greenhouse gas emmissions in road works. Technologies enabling reduction of Energy consumption and greenhouse gas emmissions in road construction.Sustainable drainage systems in road construction. Use of geosynthetics in technical solutions enabling material and energy savings. Innovative road materials. Extending the service life of pavement – life cycle of pavement.						
	Course content – exercises						
	Calculation of energy consumption and greenhouse gas emmissions resulting from construction and maintenance of a road pavement for given road section (materials, transport, construction). Comparison of equivalent pavements – asphalt and PCC.						
	Calculation of savings in terms of material, energy and gas emission in case of optimization of a pavement structure with use of geosynthetic reinforcement. Comparison of equivalent pavement structures – unreinforced and reinforced.						

Prerequisites and co-requisites	Knowledge on road construction from the subject "Roads and motorways"		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Knowledge test	60.0%	50.0%
	Passing the practical excresises	100.0%	50.0%
Recommended reading	Basic literature	<ol style="list-style-type: none">1. Katalog typowych konstrukcji nawierzchni podatnych i półsztywnych. Politechnika Gdańska/GDDKiA, 20142. Katalog typowych konstrukcji nawierzchni sztywnych. Politechnika Wrocławska/GDDKiA, 20143. Analiza porównawcza cyklu życia dla nawierzchni asfaltowych i betonowych. Instytut Techniki Budowlanej, Warszawa, 20154. Towards Sustainable Pavement Systems. A Reference Document., FHWA Report FHWA- HIF- 1–02, January 2015.5. Alenowicz J., Projektowanie nawierzchni drogowych z warstwą kruszywa wzmocnioną geosyntetykiem., Inżynieria Morska i Geotechnika, Nr 5/20156. Kazimierowicz–Frankowska K., Wzmacnianie konstrukcji dróg geosyntetykami., WKŁ, 20147. Katalog dobrych praktyk – zasady zrównoważonego gospodarowania wodami opadowymi pochodzącymi z nawierzchni pasów drogowych, Wrocław 2017	
	Supplementary literature	Scientific articles on new sustainable materials and technologies in road construction and circular economy in road construction.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Practical activites within the subject	Not applicable		

Document generated electronically. Does not require a seal or signature.