



Subject card

Subject name and code	, PG_00058841						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group			Optional subject group 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	6	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Piotr Zima				
	Teachers						
Lesson types and methods of instruction	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						
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		6.0		50.0	101
Subject objectives	Introducing students to the problems related to the transport of pollutants in water and in the air						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_K01] can think and act in a creative and enterprising way; can set priorities for the implementation of an individual or group task; understands the need for continuous training and professional responsibility for their activities and team	The student is able to define priorities for the implementation of an individual or group task; understands the need for continuous education and taking professional responsibility for his/her own and the team's activities	[SK3] Assessment of ability to organize work [SK5] Assessment of ability to solve problems that arise in practice
	K6_W12	The student understands the basic physical and geochemical processes occurring within the atmosphere, lithosphere and hydrosphere, in particular in the field of water and air movement, geological processes and the transport of heat and pollutants	[SW1] Assessment of factual knowledge
	[K6_W04] possesses elementary knowledge in the field of land mechanics, ground science, land reclamation and geotechnics; has basic knowledge about the composition of air, water and soil, environmental pollution and processes responsible for their formation and ways to reduce them, knows the principles and organization of sustainable water management	The student has basic information on the fundamental processes influencing environmental pollution	[SW1] Assessment of factual knowledge
	[K6_W05] knows the theoretical basis of hydromechanics and its practical models, necessary to solve technical problems in the field of environmental engineering (sanitary engineering, water melioration, water management and flood protection, pollution spread)	The student has knowledge of the impact of pollution on the infrastructure	[SW1] Assessment of factual knowledge
[K6_W06] has a structured and theoretically founded knowledge in the field of computer science, numerical methods and the possibilities of their applications for solving tasks, description of phenomena related to the flow of water in the environment, in open pipes and channels, filtration, migration of pollutants	The student has knowledge of mathematics and numerical methods in solving problems related to the transport of pollution	[SW1] Assessment of factual knowledge	
Subject contents	<p>WYKŁADPrzedstawienie podstawowych równań opisujących zachowanie się substancji rozproszonych w wodzie i w powietrzu. Dyfuzja, dyfuzja burzliwa, dyspersja - podstawowe mechanizmy transportu. Opis i równania funkcji źródłowych. Rozwiązania równań opisujących funkcje źródłowe. Model BZT5-tlen rozpuszczony. Rozwiązania równania transportu: równanie dyfuzji, adwekcji-dyspersji i adwekcji-dyfuzji/dyspersji-reakcji.ĆWICZENIAProjekt grupowy osadnika. Projekt grupowy emitera do atmosfery.</p>		
Prerequisites and co-requisites	Knowledge of the subject of mathematics, physics, computer science		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Substantive knowledge test	60.0%	50.0%
	Group project	60.0%	50.0%
Recommended reading	Basic literature	1. Sawicki J.M., "Przenoszenie masy i energii", Wyd. PG,Gdańsk 1993.  2. Sawicki J.M., "Migracja zanieczyszczeń", Wyd. PG, Gdańsk 2003.	
	Supplementary literature	1. Chapara S.C., "Surface Water-Quality Modeling", 1996.	
	eResources addresses	Adresy na platformie eNauczanie:	

Example issues/ example questions/ tasks being completed	List the basic processes of transporting substances in water and air. Describe the basic source functions in the pollutant transport equation. Describe the BOD5-Dissolved Oxygen model
Work placement	Not applicable

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