GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	ENVIRONMENTAL MICROBIOLOGY, PG_00038251		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	second-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	1	Language of instruction	English
Semester of study	1	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Environmental Engineering Technology -> Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Aneta Łuczkiewicz	
	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	0.0	0.0	30
	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	30	5.0	15.0	50

Subject objectives	The course aims to provide students with comprehensive knowledge of engineering microbiology. The lectures will cover issues related to microbiology of anthropogenically impacted environments: biodiversity, elements circulation, and microbiological hazards. In the laboratory - the presence, activity and microbial contamination will be analysed.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W07] has an in-depth, structured and theoretical knowledge of municipal management, including water treatment and water renewal technologies, various types of wastewater treatment technologies, including landfill leachate, sewage sludge treatment technologies; knowledge of natural methods used in water and wastewater treatment or construction, functioning, operation and closure of waste landfills	The student has a knowledge and is aware of the importance of microbiological aspects and techniques in environmental engineering	[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge
[K7_U10] can, in accordance with scientific principles, use the scientific workshop to formulate and conduct preliminary research on the engineering, technological and organizational problems that arise in environmental engineering	The student knows how to use the available analytical methods as well as conduct a laboratory experiment or field research to identify emerging engineering/ technological problems.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K7_K02] understands the need to formulate and communicate to the public information and opinions on the achievements in the environmental engineering and other aspects of the engineering activity in the sanitary sector; is aware of the importance and understands non-technical aspects and effects of engineering activities; strives to convey such information and opinions in a universally understandable manner, presenting various points of view	The student is aware of the nontechnical aspects of engineering activities, understands the need to inform and public participation in the proceedings regarding environmental impact assessments of technical facilities.	[SK1] Assessment of group work skills [SK4] Assessment of communication skills, including language correctness [SK3] Assessment of ability to organize work
[K7_U07] can plan and carry out laboratory and field experiments leading to assessment of the efficiency of water treatment, waste water treatment, waste management and sewage sludge management	The student knows how to cooperate with others in order to plan and conduct both a laboratory experiment and field research	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment

Subject contents

Technical aspects of environmental microbiology will be discussed during the course. Classical methods for testing biodiversity of microorganisms (microscopy and breeding methods) will be combined with modern biochemical, molecular and bioinformatics analyzes. The metabolic activity of microorganisms (sources of energy and carbon, sources of other biogenic elements, oxygen and anaerobic respiration) in natural systems and technological systems (e.g. methanogenesis, nitrification, denitrification, microbiological transformation of mercury, iron, sulfur) will be discussed. Research on human microbiome will be discussed in the aspect of the problem of contamination of various environmental niches.

Laboratory works will concern (I) microbiological air quality analysis, (II) microbiological analysis of watercourses in urban areas (field works) and (III) analysis of activated sludge activity using laboratory SBR reactors (e.g. AUR, NUR, NIR tests). Analytical procedures and techniques will be discussed in terms of their practical application.

Prerequisites and co-requisites

Fundamentals of microbiology

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
laboratory	60.0%	40.0%
lectures	60.0%	60.0%

Recommended reading

Basic literature	Tchobanoglous et al. Wastewater engineering, treatment and reuse, 5th edition, Metcalf and Eddy. Handouts. Volodymyr Ivanov Environmental microbiology for engineers CRC Press/Taylor & Francis Group 6000 Broken Sound Parkway, NW Suite 300 Boca Raton, FL 33487
Supplementary literature	-
eResources addresses	Adresy na platformie eNauczanie:

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