GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	ENVIRONMENTAL MICROBIOLOGY, PG_00059997		
Field of study	Environmental Engineering		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2025/2026
Education level	second-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	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 -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Aneta Łuczkiewicz	
	Teachers		

Lesson types

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	20.0	55

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_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_W07	The student understands how microbiological processes are used in municipal management, in particular in technologies related to the water-wastewater sector	[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects
K7_U07	The student is able to design and carry out or improve an existing engineering solution in the field of environmental engineering	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools

<table>
<tr><td>Subject contents</td><td>Course content – lecture
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.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Fundamentals of microbiology</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>lectures</td><td>60.0%</td><td>60.0%</td></tr>
<tr><td>laboratory,</td><td>60.0%</td><td>40.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>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</td></tr>
<tr><td>Supplementary literature</td><td>-</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>-</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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