University of Gdańsk

Subject card

Subject name and code	Pharmaceuticals in the water environment - origin, transformation, threats, PG_00079435		
Field of study	Medical Biology		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
Education level	Bachelor's 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	1.0
Learning profile	academic	Assessment form	credit
Conducting unit	Department of Experimental Biology and Plant Biotechnology -> Faculty of Biology -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Agnieszka Baścik-Remisiewicz	
	Teachers	dr Agnieszka Baścik-Remisiewicz	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	15.0	0.0	0.0	0.0	15

E-learning hours included: 0.0

Additional information:
- Text analysis with discussion
- Lecture with multimedia presentation
- Multimedia presentations prepared by students
- Part of classes in the form of e-learning

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	15	0.0	0.0	15

Subject objectives

Presenting to the student selected aspects of environmental pollution with pharmaceuticals.

Indication of the sources of these pollutants and discussion of possible transformations that pharmaceuticals may undergo in the cells of living organisms and in the environment.

Drawing attention to the threats associated with the presence of pharmaceuticals in the environment and the possibilities of preventing their effects.

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<tr><td>Learning outcomes</td><td>
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<tr><th>Course outcome</th><th>Subject outcome</th><th>Method of verification</th></tr>
<tr><td></td><td>The graduate reads with understanding scientific texts in Polish and simple texts in English regarding the hazards resulting from the presence of pharmaceuticals in the aquatic environment; independently searches for and uses available sources of information, including electronic sources.
The graduate understands the need for lifelong learning and updating knowledge in the field of studied topics and related disciplines.
The graduate is familiar with the development and current state of knowledge, as well as the latest trends in the area of hazards resulting from the presence of pharmaceuticals in the aquatic environment; indicates their relationship to other disciplines of natural or medical sciences.
The graduate has the ability to deliver oral presentations in Polish on issues related to the hazards resulting from the presence of pharmaceuticals in the aquatic environment. The graduate is able to identify
problems related to
pollution of the aquatic
environment
by pharmaceuticals and
undertake basic educational
activities
appropriate for the profession
of medical biologist.</td><td>[SK1] oral statement/conversation/ discussion
[SK2] presentation/project/paper/ report
[SK3] text preparation/written work
[SK8] observation of student's independent or team work</td></tr>
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<tr><td>Subject contents</td><td>Sources of contamination of the aquatic environment with pharmaceuticals. Pharmaceuticals found in the largest quantities in the environment. Transformations of pharmaceuticals in the cells of living organisms and in the environment - selected issues. Effects of environmental pollution with pharmaceuticals. Ways to prevent environmental contamination with pharmaceuticals.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></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>multimedia presentation prepared by a student</td><td>51.0%</td><td>50.0%</td></tr>
<tr><td>essay</td><td>51.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Kümmerer, K. (Ed.). (2008). Pharmaceuticals in the environment: sources, fate, effects and risks. Springer Science & Business Media.

Aga, D. S. (Ed.). (2007). Fate of pharmaceuticals in the environment and in water treatment systems. CRC Press.

Brooks, B. W., & Huggett, D. B. (Eds.). (2012). Human pharmaceuticals in the environment: current and future perspectives (Vol. 4). Springer Science & Business Media.

Harshkova D., Aksmann A. Zanieczyszczenie środowiska niesteroidowymi lekami przeciwzapalnym na przykładzie diklofenaku przyczyny, skutki, bioidnykacja. Kosmos (2019) 322, 185÷194

Hejna, M., Kapuścińska, D., & Aksmann, A. (2022). Pharmaceuticals in the aquatic environment: A review on eco-toxicology and the remediation potential of algae. International Journal of Environmental Research and Public Health, 19(13), 7717.

Selected articles from scientific journals.</td></tr>
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	Supplementary literature	Karthikeyan, O. P., Mehariya, S., & Bhatia, S. K. (Eds.). (2022). Algal Biorefineries and the Circular Bioeconomy: Industrial Applications and Future Prospects. CRC Press. Selected articles from scientific journals.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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