University of Gdańsk

Subject card

Subject name and code	Polar ecosystems, PG_00207334		
Field of study	Biology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Master's studies	Subject group	Obligatory subject group in the field of study 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	Polish
Semester of study	2	ECTS credits	1.0
Learning profile	academic	Assessment form	credit
Conducting unit	Laboratory of Vertebrate Ecology and Ethology -> Department of Vertebrate Ecology and Zoology -> Faculty of Biology -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Katarzyna Zmudczyńska-Skarbek	
	Teachers		

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

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	2.0	8.0	25

Subject objectives

1. Learning about the biogeography of polar ecosystems on Earth.
2. Understanding the basics of how polar ecosystems function.
3. Characterising/reviewing the fauna and flora of polar ecosystems.
4. Learning about the adaptations of polar organisms to climatic conditions.
5. Learning about the consequences of climate change for polar organisms.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLMU2_U02] is able to proficiently use the scientific literature of the biological speciality studied	is able to analyse the results of research presented in scientific articles on the ecology of polar regions	[SU1] oral statement/conversation/ discussion
[BIOLMU2_W04] has in-depth knowledge of the chosen specialization in the biological sciences	has knowledge of the functioning of terrestrial and marine ecosystems in polar regions	[SW4] test/exam - oral or written
[BIOLMU2_W01] has a deep knowledge and understanding of natural phenomena and processes at various levels of complexity	understands the phenomena and processes occurring in polar ecosystems	[SW4] test/exam - oral or written
[BIOLMU2_U07] is able to critically compare biological information from various sources and draw justified conclusions on this basis	is able to compare the results of research presented in scientific articles on the ecology of polar regions	[SU1] oral statement/conversation/ discussion
[BIOLMU2_K02] is ready to work effectively as a team member and to comply with the rules of teamwork and take responsibility for the tasks carried out	actively participates in discussions on topics presented during classes, argues his/her point of view	[SK1] oral statement/conversation/ discussion

<table>
<tr><td>Subject contents</td><td colspan="3">Biogeography of polar ecosystems (marine and terrestrial). Adaptations of plant and animal organisms to life in polar climates. Biodiversity of plant and animal organisms inhabiting polar regions. Microorganisms of polar regions. Arctic and Antarctic food webs. Sources of nutrients in polar regions. Pollution of polar regions and its consequences for organisms. Protection of biodiversity in polar regions. Consequences of climate change and anthropogenic pollution in polar regions.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Basic knowledge of ecology and biogeography. Knowledge of English sufficient to use the subject literature.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>written assessment of the content presented during classes (multiple-choice test)</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">1. Thomas et al. 2008. The biology of Polar Regions. Oxford University Press
2. Thomas 2021. Arctic Ecology. Wiley Blackwell
3. CAFF 2013. Arctic Biodiversity Assessment. Status and trends in Arctic biodiversity. Conservation of Arctic Flora and Fauna, Akureyri
4. Artykuły naukowe o tematyce polarnej, np.
Zwolicki A., Zmudczyńska-Skarbek K., Wietrzyk-Pełka P., Convey P. 2020. High Arctic Vegetation. Encyclopedia of the World's Biomes: 465- 479 https://www.elsevier.com/books/encyclopedia-of-the-world-s-biomes/goldstein/978-0-12-816096-1
Zmudczyńska-Skarbek K., Barcikowski M., Drobniak Sz.M., Gwiazdowicz D.J., Richard P., Skubała P., Stempniewicz L. 2017. Transfer of ornithogenic influence through different trophic levels of the Arctic terrestrial ecosystem of Bjørnøya (Bear Island), Svalbard. Soil Biology and Biochemistry 115: 475-489
Zmudczyńska-Skarbek K., Balazy P. 2017. Following the flow of ornithogenic nutrients through the Arctic marine coastal food webs. Journal of Marine Systems 168: 3137
Zwolicki A., Zmudczyńska-Skarbek K., Richard P., Stempniewicz L. 2016. Importance of marine-derived nutrients supplied by planktivorous seabirds to High Arctic tundra plant communities. PLoS ONE, 11: e0154950. doi:10.1371/journal.pone.0154950</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Sakshaug E, Johnsen G, Kovacs (eds). 2009. Ecosystem Barents Sea. Tapir Academic Press, Trondheim</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3"></td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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