

Subject card

Subject name and code	Non-native species in the marine environment - laboratory exercises, PG_00117735						
Field of study	Oceanography						
Date of commencement of studies	October 2025		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	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Laboratory of Ecophysiology and Bioenergetics -> Department of Marine Ecology -> Faculty of Oceanography and Geography -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Monika Normant-Saremba				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	15.0	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		25.0		15.0	55
Subject objectives	Raising knowledge about alien species in marine ecosystems, with particular emphasis on the Baltic Sea						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[OCEANMU2-K05] is ready to follow the rules occupational health and safety, taking care of the entrusted person specialized and recognition equipment emergency situations and take appropriate action activities	Is ready to comply with occupational health and safety rules and take care of the specialized equipment entrusted to him during research in the field of biology and ecology of alien species.	[SK8] observation of student's independent or team work
	[OCEANMU2-U04] is ready to develop in an analytical and synthetic way research and analysis results and based on them creating conclusions	Is able to analytically and synthetically prepare the results of research and analyzes in the field of biology and ecology of alien species and draw correct conclusions based on them.	[SU2] presentation/project/paper/report
	[OCEANMU2-U05] is able to use source information in Polish and a selected foreign language, including archival and electronic databases, in the field of oceanographic issues, performs critical analysis and synthesis of information	Is able to use source information in Polish and English, including archival and electronic databases, regarding issues related to the introduction of alien species into the marine environment, and performs critical analysis and synthesis of information.	[SU2] presentation/project/paper/report
	[OCEANMU2-K01] is ready to plan, implement and supervise, individually or collectively, next stages of the entrusted task, is ready to take responsibility for its results, cooperates effectively in the team and performs its functions in it various functions, including managerial ones	Is ready to plan, implement and supervise, individually or in a team, subsequent stages of research in the field of biology and ecology of alien species, feels responsibility for their results, cooperates effectively in a team, performing various functions, including being the leader.	[SK8] observation of student's independent or team work
	[OCEANMU2-U02] can use scientific terminology fluently and appropriately in presenting and discussing problems in the field of oceanography	Is able to fluently and appropriately use scientific terminology in presenting and discussing problems related to alien species.	[SU1] oral statement/conversation/discussion
Subject contents	Analysis of the qualitative and quantitative composition of alien species occurring on submerged surfaces in the coastal zone of the Gulf of Gdańsk, together with the development of information on taxonomic features for identification, origin, pathways and vectors of primary introduction and secondary spread, biology and ecology, with particular emphasis on the impact on local biodiversity and ecosystem services. Examples of species from the list of 100 most invasive species in the world occurring in the coastal zone of the Gulf of Gdansk and new alien species introduced to the Baltic Sea - origin, taxonomic features for identification, routes and vectors of introduction and secondary spread, biology and ecology, and potential impact on biodiversity and ecosystem services.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Practical work	51.0%	50.0%
	Presentation of results/discussion	51.0%	25.0%
	Worksheet/ report	51.0%	25.0%
Recommended reading	Basic literature	Leppäkoski E., Gollasch S., Olenin S. (red.), 2002. Invasive Aquatic Species of Europe. Distribution, Impacts and Management. Kluwer Academic Publishers, The Netherlands. Rilov G., Crooks J.A. (red.), 2009. Biological Invasions in Marine Ecosystems. Ecological, Management, and Geographic Perspectives. Springer-Verlag Berlin Heidelberg , ISBN: 978-3-540-79235-2, 641 pp.	
	Supplementary literature	Lockwood J.L., Hoopes M.F., Marchetti M.P., 2007. Invasion Ecology. 4th Edition. Blackwell Publishing.	

	eResources addresses	Supplementary https://link.springer.com/article/10.1007/s10530-016-1316-x - This paper concerns dynamics of biological invasions and pathways over time in the Baltic Sea. https://link.springer.com/article/10.2478/s13545-014-0157-4 - This paper reports for the first time on the occurrence of the oriental shrimp <i>Palaemon macrodactylus</i> M. J. Rathbun, 1902 in the coastal Polish waters. https://sciendo.com/it/article/10.1515/ohs-2019-0008 - The paper reports on the first record of <i>Sinelobus vanhaareni</i>, a non-native tanaid, in the Polish coastal waters (Gulf of Gdansk, southern Baltic Sea). https://www.reabic.net/journals/bir/2021/4/BIR_2021_Hille_etal.pdf - This paper reports the first mass occurrence of the alien, tube building polychaete <i>Ficopomatus enigmaticus</i> (Fauvel, 1923) in the Baltic Sea. https://doi.org/10.1080/08927014.2021.1996564 - This paper concerns the role of marinas in the establishment and spread of non-indigenous species in Baltic Sea fouling communities
Example issues/ example questions/ tasks being completed	Alien invertebrates in the Baltic Sea: taxonomic identification, origin, introduction pathways and vectors, biological and ecological features enabling population formation, invasive potential.	
Work placement	Not applicable	

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