University of Gdańsk

Subject card

Subject name and code	Global Changes in the Marine Environment - conversatory, PG_00204943		
Field of study	Oceanography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
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	4	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Department of Marine Ecosystems Functioning -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Filip Pniewski	
	Teachers		

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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	2.0	18.0	50

Subject objectives	To familiarise students with the causes, determinants and directions in global changes observed in marine ecosystems.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANMU2-U05] is able to use source information in Polish and a chosen foreign language, including archival and electronic databases, within the field of oceanography; critically analyzes and synthesizes information, and is capable of performing critical interpretation and synthesis of data	Students are able to make appropriate use of information and verify sources, in Polish and English, on global changes in marine ecosystems, carrying out a critical analysis thereof.	[SU1] oral statement/conversation/ discussion
[OCEANMU2-W02] knows and understands complex processes and phenomena occurring in the marine environment, with particular emphasis on the coastal zone, as well as complex relationships between living and non-living elements of the aquatic environment	Student has in-depth knowledge and understanding of the relationships between living organisms and inanimate elements of the environment, and the changes they may undergo as a result of human activity.	[SW2] presentation/project/paper/ report [SW5] implementation of a problem task
[OCEANMU2-U09] can take part in a discussion/debate using substantive arguments, has the ability to formulate opinions based on scientific knowledge and experience and creating synthetic summaries	Students are able to take the floor in a discussion on changes in the marine environment on a global scale using substantive arguments, will be able to formulate opinions on the basis of their knowledge and experience, and will be able to create synthetic summaries of threats to the marine environment.	[SU1] oral statement/conversation/ discussion
[OCEANMU2-K04] is ready to critically evaluate his/her knowledge and received content in the field of natural sciences in in particular in the field of the studied specialty, a in problematic situations, supports oneself with knowledge experts	Student is ready to critically evaluate knowledge and content in the field of marine sciences, particularly in relation to global changes of the marine environment.	[SK1] oral statement/conversation/ discussion
[OCEANMU2-W06] knows and identifies potential threats to the marine environment on a local and global scale resulting from strong anthropopressure, predicts their effects on various time and space scales	Student knows and identifies potential threats to the marine environment on a global scale resulting from strong anthropopression, and predicts their consequences in relation to the functioning of marine ecosystems and the use of marine resources.	[SW2] presentation/project/paper/ report [SW5] implementation of a problem task

Subject contents

1 Climate warming and its consequences.
2 Eutrophication - causes and consequences.
3. Ocean pollution. Marine disasters. Litter in the oceans.
4 Changes in the range of marine organisms. Alien species.
5 Progress and prospects for exploitation of animate and inanimate resources of the oceans.
6. Mariculture development, importance and impact on marine ecosystems.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
participation in a disucssion	51.0%	50.0%
report	51.0%	50.0%

Recommended reading

Basic literature

1. Kozer J., Mass K., Kothuis B. 2003. Demonstration of environmentally sound and cost-effective shipping. Journal of Cleaner Production. 11: 767-
777.
2. Nienhuis P.H. 1992. Eutrophication, water management, and the functioning of Dutch estuaries and coastal lagoons. Estuaries. 15(4): 538-548.
3. Occhipinti-Amborgi A. 2007. Global change and marine communities: Alien species and climate change. Marine Pollution Bulletin. 55: 342-352.
4. Sabine C.L., Feely R.A., Gruber N., Key R.M, Lee K., Bullister J.L., Wanninkhof R., Wong C.S., Wallace D.W.R., Til-brook B., Millero F.J., Peng T.-
H., Kozyr A., Ono T., Rios A.F. 2004. The Oceanic Sink for Anthropogenic CO2. Science. 305: 367-371.
5. Seibel B.A., Fabry V.J. 2003. Marine biotic response to elevated carbon dioxide. Advances in Applied Biodiversity Science. 4: 59-67.
6. Stachowicz J.J., Terwin J.R., Whitlatch R.B., Osman R.W. 2002. Linking climate change and biological invasions: Ocean warming facilitates
nonindigenous species invasions. PNAS. 99(24): 15497-15500.

	Supplementary literature	1. Kozer J., Mass K., Kothuis B. 2003. Demonstration of environmentally sound and cost-effective shipping. Journal of Cleaner Production. 11: 767- 777. 2. Nienhuis P.H. 1992. Eutrophication, water management, and the functioning of Dutch estuaries and coastal lagoons. Estuaries. 15(4): 538-548. 3. Occhipinti-Amborgi A. 2007. Global change and marine communities: Alien species and climate change. Marine Pollution Bulletin. 55: 342-352. 4. Sabine C.L., Feely R.A., Gruber N., Key R.M, Lee K., Bullister J.L., Wanninkhof R., Wong C.S., Wallace D.W.R., Til-brook B., Millero F.J., Peng T.- H., Kozyr A., Ono T., Rios A.F. 2004. The Oceanic Sink for Anthropogenic CO2. Science. 305: 367-371. 5. Seibel B.A., Fabry V.J. 2003. Marine biotic response to elevated carbon dioxide. Advances in Applied Biodiversity Science. 4: 59-67. 6. Stachowicz J.J., Terwin J.R., Whitlatch R.B., Osman R.W. 2002. Linking climate change and biological invasions: Ocean warming facilitates nonindigenous species invasions. PNAS. 99(24): 15497-15500.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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