University of Gdańsk

Subject card

Subject name and code	Genetics of Marine Organisms - lecture, PG_00204904		
Field of study	Oceanography		
Date of commencement of studies	October 2027	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	1	Language of instruction	Polish
Semester of study	1	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 Rafał Lasota	
	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

Insight into current research in the field of broadly understood genetics of marine organisms. Application of genetics in other fields of knowledge (including marine ecology, aquaculture, protection of biodiversity and living marine resources).

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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	Is ready to critically assess the knowledge acquired and the content received in the field of genetics of marine organisms, particularly within the scope of the studied specialization, and in problematic situations, relies on the knowledge of experts.	[SK4] test/exam - oral or written
[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	Knows and understands to an in-depth degree the course of complex genetic processes and phenomena occurring in the marine environment and the coastal zone, as well as the intricate relationships between living and non-living components of the aquatic environment in the context of the genetics of marine organisms.	[SW4] test/exam - oral or written

<table>
<tr><td>Subject contents</td><td>Methods used in research on the genetics of marine organisms and their proper selection in solving scientific problems (molecular techniques, basic statistical and bioinformatic tools).

Genetic diversity of natural populations and the main random and directional processes that shape it.

Phylogeography of marine organisms.

Occurrence and identification of cryptic species in the marine environment.

Genetic processes associated with biological invasions (founder effect, genetic drift, adaptation to new environmental conditions), identification of source populations and migration routes. Cryptic invasions.

Historical and contemporary processes determining the genetic structure of organisms in the Baltic Sea.

Application of genetic methods in mariculture (improving the quality of productive traits). Interactions between farmed and natural populations in the context of changes in their genetic structure.

Genetic changes in marine organisms caused by environmental pollution (impact on the genetic constitution of populations, gene and chromosomal mutations, genetic diseases, cancers).

Application of genetic methods in the conservation and management of marine living resources (species identification and their distribution, determination of migration directions and intensity, protection of biodiversity at the genetic level, genetic resources).

Introduction to marine metagenomics.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Knowledge of the fundamentals of molecular genetics and population genetics. Knowledge of English at an intermediate level.</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>exam</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>Charon K. M., Świtoński M. Genetyka i genomika zwierząt, Wyd. PWN, Warszawa, 2021
Brown A.T. Genomy. Wyd. PWN, Warszawa, 2025
Kartavtsev Y. Molecular Evolution and Population Genetics for Marine Biologists. CRC Press, 2015
Krzanowska H., Łomnicki A. (red.). Zarys mechanizmów ewolucji. Wyd. PWN, Warszawa, 2002</td></tr><tr><td>Supplementary literature</td><td>Beaumont A.R., Hoare K. Biotechnology and Genetics in Fisheries and Aquaculture. Wiley-Blackwell, 2003

Freeland R.J. Ekologia molekularna. Wyd. PWN, Warszawa, 2021</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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