University of Gdańsk

Subject card

Subject name and code	Basic Genetics of Marine Organisms - lecture, PG_00205243						
Field of study	Oceanography						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2028/2029			
Education level	Bachelor'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	3		Language of instruction	Polish			
Semester of study	5		ECTS credits	2.0			
Learning profile	academic		Assessment form	exam			
Conducting unit	Department of Marine Ecosystems Functioning -> Faculty of Oceanography and Geography -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Katarzyna Smolarz				
	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	The aim of the course is to discuss the basic issues of modern genetics using examples of marine organisms and to familiarize students with the basic cytogenetic and genetic techniques used in the genetics of marine organisms.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANL3-W01] has an advanced knowledge and understanding of the terminology used in oceanography and related exact and natural sciences (in Polish and a selected foreign language)	knows and understands terminology used in genetics and related exact and natural sciences to an advanced degree (in Polish, English and/or Latin) (program content: A1-9)	[SW4] test/exam - oral or written
[OCEANL3-W03] has an advanced understanding of the relationships between living and non-living components of aquatic environments, and is aware of the complex nature, intricacy, and natural variability of these environments	knows and understands at an advanced level the relationships between living and non-living elements of the aquatic environment in relation to issues related to genetics, is aware of the comprehensive nature of aquatic environments, their complexity and natural variability (program content: A6)	[SW4] test/exam - oral or written
[OCEANL3-U03] is able to process, describe, and present results, and draw conclusions	is able to develop, describe and present the results of genetic and cytogenetic tests and formulate conclusions on this basis (program content: A1-A9)	[SU4] test/exam - oral or written
[OCEANL3-K01] is willing to plan and implement, individually or as a team, the subsequent stages of the entrusted task, is willing to take responsibility for the results of these works, effectively cooperates in the team and performs various roles in it	is ready to plan and implement, individually or in a team, subsequent stages of the entrusted task, is ready to take responsibility for the results of these works, cooperates effectively in a team and performs various roles in it (program content: A1-A9)	[SK4] test/exam - oral or written

Subject contents

Topics of the lecture:

A1. Basic issues of modern genetics widely illustrated on examples of marine organisms.

A2. Nuclear and mitochondrial DNA, self-replication of genetic material and gene expression, genome structure.

A3. Properties and interaction of genes (penetration, expressiveness, inheritance of quantitative and qualitative features). A4. Characteristics of chromosomes as gene carriers (structure, functions, division, gene location, karyotype), evolution of karyotypes.

A5. Hereditary and non-hereditary variation.

A6. Numerical and structural chromosome aberrations, gene mutations and environmental factors with genotoxic and mutagenic effects, genotoxicity tests.

A7. Biochemical and molecular techniques used in marine ecology, genetic markers, measures of genetic variability and their application in practice.

A8. Allelic and non-allelic inheritance, multifactorial, heritability.

A9. Basics of population genetics.

Prerequisites and co-requisites

basic knowledge of biology, organic chemistry and statistics

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><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 rowspan="3">Recommended reading</td><td>Basic literature</td><td>Charon K.M., Świtoński M., 2006, Genetyka zwierząt, PWN
Freeland R.J., 2008, Ekologia molekularna, PWNA.
Krzanowska H., Łomnicki A., Rafiński J., Szarski H., Szymura J.M., 2002, Zarys mechanizmów ewolucji, PWN
Freeland R.J., 2008, Ekologia molekularna, PWN</td></tr>
<tr><td>Supplementary literature</td><td>1. Beebee T., 2004, An introduction to molecular ecology, Wyd. Oxford University Press
2. Brown T. A., 2001, Genomy, Wyd. PWN, Warszawa
3. Turner P.C., McLennan A.G., Bates A.D., White M.R.H., 2004, Krótkie wykłady: Biologia molekularna, PWN
4. Winter P.C., Hickey G.I., Fletcher H.L., 2006, Krótkie wykłady: Genetyka, PWN</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2"></td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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