University of Gdańsk

Subject card

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| 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<br>Optional subject group<br>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, prof. UG | | | | |
| | 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-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 |
| [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-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-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 |

## 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<br>Freeland R.J., 2008, Ekologia molekularna, PWNA.<br>Krzanowska H., Łomnicki A., Rafiński J., Szarski H., Szymura J.M., 2002, Zarys mechanizmów ewolucji, PWN<br>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<br>2. Brown T. A., 2001, Genomy, Wyd. PWN, Warszawa<br>3. Turner P.C., McLennan A.G., Bates A.D., White M.R.H., 2004, Krótkie wykłady: Biologia molekularna, PWN<br>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>
</table>

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