University of Gdańsk

Subject card

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| Subject name and code | Molecular ecology, PG_00198097 | | |
| Field of study | Natural Resources Conservation | | |
| Date of commencement of studies | October 2026 | Academic year of realisation of subject | 2027/2028 |
| Education level | Bachelor's studies | Subject group | Obligatory subject group in the field of study<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 | 2 | Language of instruction | Polish |
| Semester of study | 3 | ECTS credits | 1.0 |
| Learning profile | academic | Assessment form | credit |
| Conducting unit | Laboratory of Mammalian Evolutionary Genomics -> Department of Evolutionary Genetics and Biosystematics -> Faculty of Biology -> Rector | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr hab. Małgorzata Pilot | |
| | Teachers | | |

| Lesson types | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|---|
| | Number of study hours | 15.0 | 0.0 | 0.0 | 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 | 3.0 | 7.0 | 25 |

| Subject objectives | |
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| | 1. Introduction of new terms and research methods of molecular genetics related to multidisciplinary molecular ecology.<br><br>2. Understanding the cognitive importance and practical applications of molecular ecology. |

## Learning outcomes

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [OZPL3_K01] The graduate is ready to recognise the limitations in his/her own knowledge and understands the need for continuous learning and development | - The graduate knows the limits of his own knowledge and understands the need for constant learning and development | [SK1] oral statement/conversation/ discussion |
| [OZPL3_W09] The graduate possesses an advanced comprehension of the current state of knowledge and the latest trends in protection of natural resources, as well as their relationship to other natural disciplines | - The graduate possess the current state of knowledge about trends in molecular ecology and indicates their relationship with other natural disciplines | [SW4] test/exam - oral or written |
| [OZPL3_W13] The graduate has an advanced understanding of the rules, methods, and techniques of environmental research and their potential applications in nature conservation | - The graduate can present the basic rules, methods and techniques of conducting research on the natural environment and the possibilities of their use in nature conservation | [SW4] test/exam - oral or written |
| [OZPL3_U02] The graduate can read with comprehension scientific texts in the field of natural sciences in Polish and simple texts in English | - The graduate reads with understanding scientific texts in the field of molecular ecology in Polish and simple texts in English | [SU4] test/exam - oral or written |
| [OZPL3_W02] The graduate possesses advanced knowledge and understanding of the mechanisms governing the flow of genetic information, its regulation, the principles of inheritance, and the origins of variation in organisms | - The graduate knows the tools and latest techniques of molecular genetics applied in ecological research | [SW4] test/exam - oral or written |
| [OZPL3_K08] The graduate is ready to systematically update his/ her natural knowledge and to apply it in practice | - The graduate systematically updates the knowledge of nature and knows its practical applications | [SK1] oral statement/conversation/ discussion |

## Subject contents

- History of molecular ecology; - Theoretical basis of molecular ecology: population genetics; - Application of molecular genetics tools in ecological research: molecular markers and novel molecular techniques; - Use of molecular data for genetic analysis of populations; - Application of the Next Generation Sequencing (NGS) in molecular ecology; - Application of molecular ecology in taxonomic studies; - Basic aspects of phylogeography and landscape genetics; - Molecular ecology in nature conservation; - Practical application of molecular ecology

## Prerequisites and co-requisites

## Assessment methods and criteria

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| Test | 51.0% | 100.0% |

## Recommended reading

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| Basic literature | - Freeland J.R. 2020. Molecular Ecology, Third Edition. ISBN: 978-1-119-42615-8; John Wiley & Sons, Ltd; - Rowe G., Sweet M., Beebee T. 2017. An introduction to Molecular Ecology. ISBN: 9780198716990; Oxford University Press |
| Supplementary literature | Węgleński P. 2020. Genetyka molekularna. ISBN: 978-83-01-14744-0; PWN Warszawa |
| eResources addresses | |

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|---|---|
| Example issues/ example questions/ tasks being completed | - What are the potential sources of DNA for molecular research?;<br>- What are the main applications of DNA barcoding?;<br>- What are the causes of outbreeding depression?;<br>- What factor determines the rate of heterozygosity loss in a population due to genetic drift?;<br>- What are the main consequences of the bottleneck effect?;<br>- What is the founder effect?;<br>- How does the rate of migration between populations affect the degree of genetic variation between them?;<br>- What mechanisms lead to genetic differentiation of populations?;<br>- How are Evolutionarily Significant Units determined? |
| Work placement | Not applicable |

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