

**Subject card**

|  |   |  |                        |                                     |  |            |     |
|--|---|--|------------------------|-------------------------------------|--|------------|-----|
| <b>Subject name and code</b>                       | Molecular phylogenetics versus taxonomy, PG_00117658  |  |                        |                                     |  |            |     |
| <b>Field of study</b>                              | Biology   |  |                        |                                     |  |            |     |
| <b>Date of commencement of studies</b>             | October 2024  | <b>Academic year of realisation of subject</b>           |                        |                                     | 2025/2026  |            |     |
| <b>Education level</b>                             | postgraduate studies  | <b>Subject group</b>                                     |                        |                                     | Obligatory subject group in the field of study<br>Optional subject group |            |     |
| <b>Mode of study</b>                               | full-time studies   | <b>Mode of delivery</b>                                  |                        |                                     | at the university  |            |     |
| <b>Year of study</b>                               | 2   | <b>Language of instruction</b>                           |                        |                                     | Polish   |            |     |
| <b>Semester of study</b>                           | 3   | <b>ECTS credits</b>                                      |                        |                                     | 1.0  |            |     |
| <b>Learning profile</b>                            | academic  | <b>Assessment form</b>                                   |                        |                                     |  |            |     |
| <b>Conducting unit</b>                             | Pracownia Ewolucji Molekularnej i Bioinformatyki -> Katedra Genetyki Ewolucyjnej i Biosystematyki -> Faculty of Biology   |  |                        |                                     |  |            |     |
| <b>Name and surname of lecturer (lecturers)</b>    | <b>Subject supervisor</b>   |  | dr hab. Marcin Górniak |                                     |  |            |     |
|  | <b>Teachers</b>   |  |                        |                                     |  |            |     |
| <b>Lesson types</b>                                | <b>Lesson type</b>  | Lecture  | Tutorial               | Laboratory                          | Project  | Seminar    | SUM |
|  | <b>Number of study hours</b>  | 0.0  | 15.0                   | 0.0                                 | 0.0  | 0.0        | 15  |
|  | E-learning hours included: 0.0  |  |                        |                                     |  |            |     |
| <b>Learning activity and number of study hours</b> | <b>Learning activity</b>  | Participation in didactic classes included in study plan |                        | Participation in consultation hours |  | Self-study | SUM |
|  | <b>Number of study hours</b>  | 15   |                        | 3.0                                 |  | 7.0        | 25  |
| <b>Subject objectives</b>                          | Introducing students to the molecular aspects of evolution and bioinformatics methods used in evolutionary studies. It will be demonstrated that the theory of evolution allows for the integration of seemingly disparate areas of biological research into a coherent system. |  |                        |                                     |  |            |     |

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|--|--|---|-----------------------------------|
| Learning outcomes  | Course outcome   | Subject outcome   | Method of verification            |
|  | [BIOLMU2_U01] the graduate is able to select and apply research techniques and tools appropriate to the problems of the biological sciences specialisation studied   | The student is able to:<br>1. Classify nucleic acids and perform replication, transcription, and translation.<br>2. Select an appropriate molecular marker to solve a given phylogenetic and taxonomic problem.<br>3. Edit, align, and retrieve homologous DNA sequences from a database.<br>4. Construct, describe, and interpret simple phylogenetic trees. | [SU4] test/exam - oral or written |
|  | [BIOLMU2_W04] the graduate has an in-depth knowledge of the chosen specialisation in the biological sciences   | The student knows:<br>1. The structures of nucleic acids and proteins, as well as the flow of genetic information in the cell.<br>2. Sources of genetic variation, types of molecular markers, their inheritance patterns, and the processes shaping genetic variation in populations.  | [SW4] test/exam - oral or written |
|  | [BIOLMU2_U02] the graduate is able to make proficient use of the scientific literature of the biological speciality studied  | The student is able to:<br>1. provide examples of applications in contemporary research.  | [SU4] test/exam - oral or written |
|  | [BIOLMU2_W03] the graduate knows and understands research problems at the frontiers of biological sciences that require the use of advanced tools  | The student knows:<br>1. Useful molecular techniques.<br>2. Selected methods for constructing and interpreting phylogenetic trees primarily based on DNA sequences.<br>3. The principle of the molecular clock.<br>4. Selected applications on provided examples.   | [SW4] test/exam - oral or written |
| Subject contents   | Genetic diversity at the molecular level: genes, genetic code, mutations. Genetic variability at the population level. Natural selection, neutral evolution, molecular evolution. Dynamics of DNA sequence changes and the molecular clock. Phylogeny and molecular taxonomy: application of bioinformatics methods. |   |                                   |
| Prerequisites and co-requisites                          | The student should have previously completed the following courses:1. Biochemistry,2. Molecular Biology,3. Cell Biology,4. Biodiversity and Evolution,5. Statistics.   |   |                                   |
| Assessment methods and criteria                          | Subject passing criteria   | Passing threshold   | Percentage of the final grade     |
|  | Exam   | 51.0%   | 100.0%                            |
| Recommended reading                                      | Basic literature   | Markery molekularne, historia naturalna i ewolucja. Avise John C (2008) Warszawa. Wyd. UWŁatwe drzewa filogenetyczne. Hall Barry (2008) Warszawa, Wyd. UW   |                                   |
|  | Supplementary literature   | Selected scientific articles.   |                                   |
|  | eResources addresses   | Adresy na platformie eNauczanie:  |                                   |
| Example issues/ example questions/ tasks being completed | None   |   |                                   |
| Work placement   | Not applicable   |   |                                   |

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