# Subject card

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| Subject name and code | Bioinformatics for biologists, PG_00132656 | | |
| Field of study | Biology | | |
| Date of commencement of studies | October 2024 | Academic year of realisation of subject | 2026/2027 |
| Education level | Bachelor's studies | Subject group | Obligatory subject group 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<br>Polish |
| Semester of study | 5 | ECTS credits | 1.0 |
| Learning profile | academic | Assessment form | credit |
| Conducting unit | Laboratory of Molecular Evolution and Bioinformatics -> Department of Evolutionary Genetics and Biosystematics -> Faculty of Biology -> Rector | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | prof. dr hab. Marek Ziętara | |
| | Teachers | | |

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| 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 | | | | | | |

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| 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 | 2.0 | 8.0 | 25 |

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| Subject objectives | To introduce students to advanced bioinformatics tools for the basics: molecular phylogenetics, structural bioinformatics, genomics and proteomics, and genetic variation analysis. |

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
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| [BIOLL3_W12] The graduate knows and understands the principles of using IT tools for data analysis and interpretation of natural phenomena and processes | The student knows the principles of analysis of the structure and function of DNA and proteins. | [SW4] test/exam - oral or written |
| [BIOLL3_W11] The graduate knows the basic methods of statistical analysis and their importance in the interpretation of phenomena and processes | The student has knowledge of the operation of programs for bioinformatic analyses and methods of construction and interpretation of phylogenetic trees based on DNA and protein sequences. | [SW4] test/exam - oral or written |

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| Subject contents | Introduction to biological databases. Sequence comparison. Models of DNA substitution. Introduction to molecular phylogenetics. Construction of phylogenetic trees on a selected research model - methods and programs. The principle of the molecular clock. Predicting genes and promoters. Structural bioinformatics. Mapping, assembling and comparing genomes. Introduction to functional genomics and proteomics. Analysis of genetic variation. |

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| Prerequisites and co-requisites | formal requirements: passing Bioinformatics exercises for biologists before admission to the exam.<br>additional requirements:<br>1. The student is obliged to participate in classes, and in the event of absence, it must be excused in accordance with paragraph 12 of the UG Study Regulations.<br>2. The condition for passing the lecture is attendance at least 80% of classes.<br>3. The student is obliged to fill in the gaps in knowledge and skills caused by the absence from lectures on his/her own, while the gaps in knowledge and skills caused by the absence from the classes in the manner and on the date indicated by the Lecturer. | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Written test | 51.0% | 100.0% |
| Recommended reading | Basic literature | A. Literature required for the final credit of the course:A1. used during classes: Jin Xiong, Podstawy bioinformatyki. Wydawnictwo Uniwersytetu WarszawskiegoA2. Self-studied by the student: Barry G. Hall Łatwe drzewa filogenetyczne. Wydawnitwo Uniwersytetu Warszawskiego | |
| | Supplementary literature | B. Supplementary literature:<br>• Baxevanis A.D., Oullette B.F. (red.) (2005) Bioinformatyka - podręcznik do analizy genów i białek. PWN, ISBN 83-01-142111<br>• Paul G. Higgs, Teresa K. Attwood (2008) Bioinformatyka i ewolucja molekularna. PWN, ISBN 978-83-01-15494-3<br>• scientific articles indicated by the lecturer | |
| | eResources addresses | | |
| Example issues/ example questions/ tasks being completed | No applicable | | |
| Work placement | Not applicable | | |