University of Gdańsk

Subject card

Subject name and code	Bioinformatics for biologists, PG_00079747		
Field of study	Biology		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
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
Semester of study	5	ECTS credits	1.0
Learning profile	academic	Assessment form	credit
Conducting unit			
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Marek Ziętara	
	Teachers	prof. dr hab. Marek Ziętara	

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

Additional information:

The number of hours a student works consists of 15 hours of classes, 2 hours of consultations, and 8 hours of independent work.

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	0.0	0.0	15

Subject objectives

The aim of the course is to familiarize students with advanced bioinformatics tools, with the techniques of molecular phylogenetics, with elements of structural bioinformatics and with the basics of genomics.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLL3_W11] the graduate has an advanced knowledge of 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
[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_U04] the graduate can apply statistical methods and computer algorithms and techniques to describe phenomena and analyse biological data	Effect achieved in exercises.	[SU2] presentation/project/paper/ report
[BIOLL3_K05] the graduate is ready to be responsible for his/her own and others' safety at work and to recognise risk situations and take appropriate action	Effect achieved in exercises.	[SK8] observation of student's independent or team work

<table>
<tr><td>Subject contents</td><td>Lecture: Molecular evolution in bioinformatics terms. Discussion of phylogenetic relationships of diagnosed taxa in the selected research model. Characteristics and interpretation of phylogenetic trees (discussion of the reliability of tree topology, the phenomenon of gene duplication - orthologs and paralogues, the phenomenon of incomplete sorting of phylogenetic lines, the phenomenon of attraction of long branches, hybridization, the problem of the outer group). The issue of the molecular clock. Selected RNA/protein structures. Discussion and comparison of genomes in the selected research model.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>formal requirements:

passing the Bioinformatics exercises in diagnostics before admission to the exam.

prerequisites: Knowledge and skills in Fundamentals of Bioinformatics. additional requirements:

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.

2. The condition for passing the lecture is attendance at least 80% of classes.

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.</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Written exam</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>A. Literature required for the final passing of the course (passing the exam):

A.1. used during classes

Jin Xiong. Podstawy bioinformatyki. Wydawnictwa Uniwersytetu Warszawskiego

A.2. studied by the student on his or her own

Barry G. Hall Łatwe drzewa filogenetyczne. Wydawnictwa Uniwersytetu Warszawskiego

scientific articles indicated by the lecturer</td></tr><tr><td>Supplementary literature</td><td>B. Supplementary literature

Baxevanis A.D., Ouellette B.F. (red.) (2005) Bioinformatyka - podręcznik do analizy genów i białek. PWN, ISBN 83-01-142111

Paul G. Higgs, Teresa K. Attwood (2008) Bioinformatyka i ewolucja molekularna. PWN, ISBN: 978-83-01-15494-3</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Nie dotyczy</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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