University of Gdańsk

Subject card

Subject name and code	Bioinformatics in diagnostics, PG_00090660		
Field of study	Genetics and Experimental Biology		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
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	6	ECTS credits	2.0
Learning profile	academic	Assessment form	exam
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	30.0	0.0	0.0	0.0	0.0	30

E-learning hours included: 0.0

Additional information:

The number of student work hours consists of 30 hours of classes, 3 hours of consultations, and 17 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	30	0.0	0.0	30

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
[GBEL3_W01] A graduate has an advanced knowledge and understanding of: the structure and properties of the main types of biological macromolecules; the molecular mechanisms of basic metabolic pathways and genetic information flow; the sources of genetic variation in organisms and the mechanisms of evolution. They can explain the principles of inheritance, the differences in structure and function between prokaryotic and eukaryotic cells, as well as the structure and functional relationships at the cellular and tissue levels.	It describes the structure and properties of macromolecules, as well as explains the rules of their inheritance. He knows the principles of evolution sequences, structure and function of DNA.	[SW4] test/exam - oral or written
[GBEL3_W08] A graduate has an advanced knowledge and understanding of: information technology applied to genetics and experimental biology	Knows the principles of operation of bioinformatic analysis programs and selected methods of construction and interpretation of phylogenetic trees based on DNA and protein sequences.	[SW4] test/exam - oral or written

Subject contents	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.
Prerequisites and co-requisites	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.
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Written exam	51.0%	100.0%

Recommended reading	Basic literature	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
	Supplementary literature	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
	eResources addresses	
Example issues/ example questions/ tasks being completed	Not applicable	
Work placement	Not applicable	

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