

Subject card

Subject name and code	Bioinformatics for biologists, PG_00079747						
Field of study	Biology						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2024/2025		
Education level	Bachelor's studies		Subject group				
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish 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		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	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		
	[BIOLL3_W11] the graduate knows and understands 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		
	[BIOLL3_W12] the graduate knows and understands the principles of using computer 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		
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 Bioinformatics exercises for biologists 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.		
Assessment methods and criteria	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.		
	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 Warszawskiego	
		A2. Self-studied by the student: Barry G. Hall Łatwe drzewa filogenetyczne. Wydawnitwo Uniwersytetu Warszawskiego	
		scientific articles indicated by the lecturer	
	Supplementary literature	B. Supplementary literature:	
		- Baxevanis A.D., Oullette 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	No applicable		
Work placement	Not applicable		

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