

Subject card

Subject name and code	Bioinformatics in diagnostics, PG_00147784						
Field of study	Genetics and Experimental Biology						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2027/2028		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study Subject group related to scientific research 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		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						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	E-learning hours included: 0.0						
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		3.0		17.0	50
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_K08] Responsibility for entrusted equipment/materials and respect for the work of others.		Is responsible for the computer equipment/materials entrusted to him/her, his/her own work and respects the work of others.		[SK1] oral statement/conversation/discussion [SK8] observation of student's independent or team work		
	[GBEL3_U04] Capable of reading scientific texts in English and Polish with comprehension, synthesizing the knowledge contained within them, preparing well-documented studies on biological issues, as well as those related to research commercialization.		Can read and understand scientific texts in bioinformatics in English and prepare their translation into Polish.		[SU1] oral statement/conversation/discussion [SU8] observation of student's independent or team work		
	[GBEL3_U02] Utilize computer programs for performing analyses and calculations, as well as utilize databases and bioinformatics tools to solve biological problems.		The student uses bioinformatics tools to classify biological data and obtain the structures of second- and third-order biological molecules.		[SU2] presentation/project/paper/report		
Subject contents	Exercises: Reconstruction of phylogenetic relationships of diagnosed taxa in a selected research model. Use of bioinformatics tools for detailed description of phylogenetic trees for their presentation and interpretation. Estimation of phylogenetic compounds using the molecular clock method. Application of bioinformatics methods to predict selected RNA/protein structures. Application of bioinformatics methods to map, assemble and compare genomes. Use of specialized software (e.g. MEGA, Seaview, BEAST, MrBayes, tRNAscan-SE).						

Prerequisites and co-requisites	prerequisites: knowledge and skills in Fundamentals of Bioinformatics.		
	formal requirements: the student is obliged to participate in the lecture Bioinformatics in diagnostics		
	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 exercises is participation in at least 85% 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
	Colloquium	51.0%	60.0%
	Average of partial grades	51.0%	40.0%
Recommended reading	Basic literature	A. Literature required for the final passing of the course (passing the exam):A.1. used during classesJin Xiong. Podstawy bioinformatyki. Wydawnictwa Uniwersytetu WarszawskiegoA.2. studied by the student on his or her ownBarry G. Hall Łatwe drzewa filogenetyczne. Wydawnictwa Uniwersytetu Warszawskiegoscientific 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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