

Subject card

Subject name and code	Advanced bioinformatic methods, PG_00153695						
Field of study	Zaawansowane metody bioinformatyczne						
Date of commencement of studies	October 2025		Academic year of realisation of subject			2026/2027	
Education level	Bachelor's studies		Subject group			Obligatory subject group in the field of study Optional subject group 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	2		Language of instruction			Polish	
Semester of study	4		ECTS credits			2.0	
Learning profile	academic		Assessment form			credit	
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Stanisław Ołdziej				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	20.0	0.0	10.0	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		5.0		15.0	50
Subject objectives	The goal of the course is to familiarize the student with the tools used in bioinformatics and structural biology to analyze genes and their products and the ability to apply them. The student will also become familiar with the basic databases used in bioinformatics and structural biology, and methods of searching, selecting, verifying and presenting information.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOTECHL3_U03] The graduate is able to use basic mathematical and statistical methods to describe phenomena and analyse data; analyse basic data in professional databases used in biotechnology	Acquisition of skills regarding the application of tools used in bioinformatics and structural biology	[SU5] realizacja zadania problemowego
	[BIOTECHL3_U04] The graduate is able to use scientific information, including English-language information, on biotechnology in the fields of exact and natural sciences, as well as medical sciences and health sciences; use electronic sources; use appropriate databases	Acquire skills regarding the use of information contained in scientific databases	[SU5] realizacja zadania problemowego
	[BIOTECHL3_W09] The graduate knows and understands the basic concepts and terminology used in biological and medical sciences as well as concepts from related scientific disciplines	Learn and apply concepts and terminology used in bioinformatics and structural biology	[SW5] realizacja zadania problemowego
	[BIOTECHL3_W07] The graduate knows and understands basic techniques and research tools used in biotechnology.	Acquire knowledge of tools used in bioinformatics and structural biology	[SW5] realizacja zadania problemowego
	[BIOTECHL3_K05] The graduate is willing to understand the need to inform the society about the achievements of biotechnology important for the improvement of health and quality of life.	Risks and benefits of using machine learning algorithms (artificial intelligence)	[SK5] realizacja zadania problemowego
Subject contents	Databases collecting biological data (amino acid sequences, nucleotide sequences, biomolecule structures, metabolic pathways, medical data). Algorithms used in bioinformatics to analyze genes and their products. Analysis data derived from high-throughput techniques (next-generation sequencing (NGS), mass spectrometry) Basic programming. Application of machine learning algorithms in bioinformatics and structural biology		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final report	51.0%	100.0%
Recommended reading	Basic literature	Bioinformatyka. Podręcznik do analizy genów i białek Andreas D. Baxevanis, B.F. Francis Ouellette (red.) PWN 2004 P.G. Higgs, T.K. Attwood. Bioinformatyka i ewolucja molekularna, PWN, 2008	
	Supplementary literature	Supplementary literature provided during the course.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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