University of Gdańsk

Subject card

Subject name and code	Advanced bioinformatic methods, PG_00153695						
Field of study	Biotechnology						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2027/2028		
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 selected 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_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.	Is able to enlist risks and benefits of using machine learning algorithms (artificial intelligence)	[SK5] implementation of a problem task
[BIOTECHL3_W07] The graduate has advanced knowledge of the rules of operation and the possibilities of using research techniques and tools used in biotechnology.	Acquire knowledge of tools used in bioinformatics and structural biology	[SW5] implementation of a problem task
[BIOTECHL3_U04] The graduate is able to search for, analyse and use scientific information, also in English, in the field of biotechnology in the fields of exact and natural sciences and medical and health sciences; uses electronic sources; has advanced skills in using appropriate databases.	Acquire skills regarding the use of information contained in scientific databases	[SU5] implementation of a problem task
[BIOTECHL3_U03] The graduate applies mathematical and statistical methods to describe phenomena and analyze data and is able to use professional databases used in biotechnology.	Acquisition of skills regarding the application of tools used in bioinformatics and structural biology	[SU5] implementation of a problem task
[BIOTECHL3_W09] The graduate possesses structured and advanced knowledge of the terminology and concepts used in biological and medical sciences and related disciplines.	Possesses advanced knowledge enabling the correct use of concepts and terminology in the field of bioinformatics and structural biology	[SW5] implementation of a problem task

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

ABC of 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	Bioinformatics. A Handbook of Gene and Protein Analysis Andreas D. Baxevanis, B.F. Francis Ouellette (eds.) PWN 2004 P.G. Higgs, T.K. Attwood. Bioinformatics and Molecular Evolution, 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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