University of Gdańsk

Subject card

Subject name and code	Introduction to bioinformatics, PG_00203433						
Field of study	Medical Biology						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2028/2029		
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	5		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Beata Guzow-Krzemińska				
	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		4.0		16.0	50
Subject objectives	To introduce students to basic bioinformatics tools and methods of sequence analysis. To train students to use modern bioinformatics tools. To obtain skills in acquiring biological data from databases and analyzing these data.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLMEDL3_W05] identifies the mathematical tools necessary for understanding the laws of nature and describing biological processes, is familiar with methods of statistical analysis, and understands their significance in interpreting biological phenomena and processes	knows basic tools in bioinformatics and understands their importance in molecular data analysis	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[BIOLMEDL3_U10] learns independently and in a focused manner, and is able to set priorities and organise the work of a small team, as well as work effectively within a team	is able to prioritize and organize the work of a small team and work effectively as part of a team	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
[BIOLMEDL3_W09] describes the principles of using computer tools to analyze data and interpretation of biological phenomena and processes	knows and describes the principles of using bioinformatics tools for data analysis and interpretation of biological phenomena and processes	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[BIOLMEDL3_U07] can interpret scientific data related to the profession of medical biologist	can analyze sequences of biological molecules and can interpret the results of simple bioinformatics analyses	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written [SU6] demonstration of practical skills
[BIOLMEDL3_U03] applies basic statistical methods and computer algorithms and techniques to describe phenomena and data analysis	applies basic bioinformatics tools to analyze biological data	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written [SU6] demonstration of practical skills
[BIOLMEDL3_K02] is aware of their own limitations and knows when to turn to experts who have the resources, technologies and knowledge to provide certainty on a given topic, save time and avoid mistakes	is aware of his/her own limitations and knows when to seek expert assistance	[SK2] presentation/project/paper/ report [SK8] observation of student's independent or team work

Subject contents

The topics covered include the following: health and safety guidelines and ergonomics for computer work; introduction to databases; obtaining and processing of biological information using biological and biomedical databases - nucleotide and amino acid sequences, structures of biological molecules, literature; introduction to sequence analysis methods; overview of basic bioinformatics tools: editing and analysis of chromatograms, sequence comparison, primer design, sequence alignment, search and visualization of tertiary structures of biological molecules, in silico cloning.

Prerequisites and co-requisites

Completed course: Molecular basis of medical biology
Good computer skills, including MS Office.
At least basic knowledge of molecular biology, types of biological macromolecules and basic mechanisms at the molecular level.
Good English language skills enabling one to work with software and databases.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Preparationof group project and presentation of results	51.0%	40.0%
class work	51.0%	10.0%
test	51.0%	50.0%

Recommended reading

Basic literature	Lesk A. (2019) Wprowadzenie do bioinformatyki. Wydawnictwo Naukowe PWN, ISBN 9788301208110 Baxevanis A.D., Ouellette B.F. (red.) (2005) Bioinformatyka - podręcznik do analizy genów i białek. PWN, ISBN 83-01-14211-1 Xiong J. (2011) Podstawy bioinformatyki, PWN, ISBN: 9788323505112
Supplementary literature	Paul G. Higgs, Teresa K. Attwood (2008) Bioinformatyka i ewolucja molekularna. PWN, ISBN: 978-83-01-15494-3 https://www.ncbi.nlm.nih.gov/books/NBK1762/ https://www.ncbi.nlm.nih.gov/books/NBK143764/ Marta A. Skowron, Beata Guzow-Krzemińska, Sylwia Barańska, Paulina Jędrak, Grzegorz Węgrzyn. 2015. A rapidly progressing, deadly disease of Actias selene (Indian moon moth) larvae associated with a mixed bacterial and baculoviral infection. Journal of Biosciences 40(3):487-495.
eResources addresses	

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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