University of Gdańsk

Subject card

Subject name and code	Introduction to bioinformatics, PG_00118898		
Field of study	Medical Biology		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
Education level	Bachelor's studies	Subject group	Obligatory subject group 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	dr Beata Guzow-Krzemińska dr Natalia Olędrzyńska dr hab. Marcin Górniak dr Agata Szwarc	

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

Additional information:

self-study (preparation of project, presentation) 16 hours

Participation in consultation 4 hours

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	0.0	0.0	30

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
	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
	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
	has knowledge of basic techniques and bioinformatics tools and understands their importance in molecular data analysis	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
	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
	applies basic bioinformatics tools to analyze biological data	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written [SU6] demonstration of practical skills
	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

Subject contents

Topics covered include the following: health and safety rules and ergonomics of working at a computer; introduction to databases; acquisition and processing of biological information using biological and biomedical databases - nucleotide and amino acid sequences, structures of biological molecules, literature; introduction to methods of sequence analysis; 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
class work	51.0%	10.0%
test	51.0%	50.0%
Preparationof group project and presentation of results	51.0%	40.0%

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