University of Gdańsk

Subject card

Subject name and code	Introduction to bioinformatics, PG_00147116		
Field of study	Genetics and Experimental Biology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	undergraduate 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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	2.0
Learning profile	academic	Assessment form	
Conducting unit	Faculty of Biology		
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	3.0	17.0	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
[GBEL3_W08] information technology applied in genetics and experimental biology.	Has knowledge of basic bioinformatics techniques and tools and understands their importance in molecular data analysis, knows and describes the principles of use of bioinformatics tools for data analysis and interpretation of biological phenomena and biological processes.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[GBEL3_U02] Utilize computer programs for performing analyses and calculations, as well as utilize databases and bioinformatics tools to solve biological problems.	Applies basic bioinformatics tools to analyze biological data and 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
[GBEL3_U07] Work in a team and organize work while adhering to occupational health and safety principles and ergonomics.	Can work in a small group on the task received.	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
[GBEL3_K07] Lifelong learning and updating knowledge in the field of molecular genetics and other disciplines.	Understands the need for lifelong learning and updating knowledge in bioinformatics and other fields.	[SK2] presentation/project/paper/ report [SK8] observation of student's independent or team work

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	Knowledge of the basics of molecular biology, basic mechanisms at the molecular level, and basic types of macromolecules biological. At least basic knowledge of English enabling work with English-language programs and databases.	
Assessment methods and criteria		

Subject passing criteria	Passing threshold	Percentage of the final grade
Preparation of 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/ Beata Guzow-Krzemińska, Tomasz Gąsior, Agnieszka Szalewska-Pałasz. 2015. Phylogenetic relationship of the stringent response-related genes of marine bacteria. Acta Biochimica Polonica 62(4): 773-783. 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. Additional literature provided during classes.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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