University of Gdańsk

Subject card

Subject name and code	Biological data visualization, PG_00189319		
Field of study	Biology		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
Education level	Master's studies	Subject group	Obligatory subject group in the field of study Optional subject group
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Centrum Genomiki i Bioinformatyki Stosowanej -> Faculty of Biology -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Marcin Jąkalski	
	Teachers	dr Marcin Jąkalski	

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

eNauczanie source addresses:
Moodle ID: 13503 Wizualizacje Danych Biologicznych (Biologia)
https://mdl.ug.edu.pl/course/view.php?id=13503

Additional information:

- computer laboratory

- solving tasks

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

- Familiarizing students with various types of biological data visualization and visualization generation tools

- Preparing students to create professional illustrations ready for including in theses, presentations, scientific posters, and scientific publications

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLMU2_U03] the graduate can critically analyse and select biological information, especially from electronic sources	the graduate can critically analyse and select biological information, especially from electronic sources	[SU5] implementation of a problem task [SU8] observation of student's independent or team work
[BIOLMU2_U08] the graduate is able to present research work in the field of the selected specialisation of biological sciences using verbal communication means and multimedia	the graduate is able to present research work in the field of the selected specialisation of biological sciences using verbal communication means and multimedia	[SU1] oral statement/conversation/ discussion [SU5] implementation of a problem task
[BIOLMU2_W07] the graduate is familiar with specialised bioinformatics tools, useful in solving problems of the studied specialisation of biological sciences	the graduate is familiar with specialised bioinformatics tools, useful in solving problems of the studied specialisation of biological sciences	[SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task
[BIOLMU2_U01] the graduate is able to select and apply research techniques and tools appropriate to the problems of the biological sciences specialisation studied	the graduate is able to select and apply research techniques and tools appropriate to the problems of the biological sciences specialisation studied	[SU1] oral statement/conversation/ discussion
[BIOLMU2_K03] the graduate is ready to identify priorities in order to accomplish a task defined by him/herself or by others	the graduate is ready to identify priorities in order to accomplish a task defined by him/herself or by others	[SK1] oral statement/conversation/ discussion [SK8] observation of student's independent or team work

Subject contents

1. Generating basic chart types (box plot, violin plot, histogram, scatter plot, bar chart, pie chart)

2. R language and selected graphics packages

3. UpSet chart

4. Principal component analysis (PCA) chart

5. Phylogenetic visualizations (iTol tool)

6. Heatmaps with annotations

7. Genomic visualizations (Manhattan plot, GWAS data visualization, genomic browsers)

8. Visualization of protein and nucleic acid structures

9. Circos plots

10. Inkscape and vector graphics

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
completing assignments	51.0%	40.0%
completing worksheets	51.0%	60.0%

Recommended reading	Basic literature	A.1. used during classes Documentation for selected graphics packages and programs indicated by the instructor (online resources) A.2. Studying independently by the student P. Biecek 2017. Przewodnik po pakiecie R. Oficyna Wydawnicza GiS. W. Chang 2012. R Graphics Cookbook. OReilly Media JP Lander 2018. Język R dla każdego Zaawansowane analizy i grafika statystyczna. APN Promise.
	Supplementary literature	K Cieśla 2021. Inkscape Podstawowa obsługa programu. Wydawnictwo Helion..
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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