

# Data visualization methods Educational subject description sheet

# **Basic information**

Field of study		Didactic cycle						
Biotechnology		2023/24						
Speciality - Organizational unit Faculty of Biology and Biotechnology Study level first cycle (engineering degree)		Subject code BBTBTjS_D.340K.01634.23 Lecture languages english Mandatory Elective subjects						
					<b>Study form</b> full-time studies		Block Major subjects	
					Education profile General academic		Disciplines Biological sciences	
Coordinator	Agnieszka Skarzyńska							
Teacher	Agnieszka Skarzyńska							
Period	Examination		Number of					
Semester 7	Pass with grade		<b>ECTS points</b>					
	Activities and hours							
	Laboratory exercises: 15							

### Goals

Code	Goal
C1	The aim of the course is to develop the ability to present raw data, information and analysis results using the known methods of visualization. Proper selection of tools and visualization techniques adapted to the type of information resources presented and the purpose of developing a clear report of data and information.

## **Entry requirements**

Knowledge of concerning the information technology.

### Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods	
Knowledge	Knowledge - Student knows and understands:			
W1	the useful functions and types of graphs for representing different kinds of data	BTj_K3_W04	Project, Assessment of activity during classes	
W2	the experimental visualization at the planning stage	BTj_K3_W04	Project, Assessment of activity during classes	
Skills - Student can:				
U1	efficient navigate in the environment of data visualization programs, create studies and professional charts	BTj_K3_U01_inz, BTj_K3_U21	Project, Assessment of activity during classes	
Social competences - Student is ready to:				
К1	analyze data from experiments and their professional presentation	BTj_K3_K01, BTj_K3_K02	Project, Assessment of activity during classes	

# Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Preparation of data for visualization. Graphs for raw data (line, bar, picture, scatter), graphs for assessing the distribution of variables (normality plots, histograms), dependence graphs (correlations, regressions), complex graphs (categorized, cross- sectional, merged). Chart exploration (rotating, zooming, panning, hiding planes and frames). Processes to automate the creation and customization of charts. Data and information report. Data presentation using infographics.	W1, W2, U1, K1	Laboratory exercises

### Course advanced

Activities	Methods of conducting classes	
Laboratory exercises	Case study, Presentation, Problem solving, E-learning - exercises part	
Activities	Examination method	Percentage
Laboratory exercises	Project	50%
Laboratory exercises	Assessment of activity during classes	50%

Activities	Credit conditions
Laboratory exercises	Assessment of self-performed tasks, assesment of activity during classes.

### Literature

#### Obligatory

1. current Internet sources provided by the teacher

#### Optional

- 1. Ware C., Information Visualization. Perception for design, Elsevier, Cambridge, MA, 2021
- 2. Kirk A., Data Visualisation. A handbook for data driven design, SAGE, 2019

## **Calculation of ECTS points**

Activity form	Activity hours*
Laboratory exercises	15
Preparation for exercises	5
Preparing the project	5
	Hours
Student workload	25
Number of ECTS points	ECTS 1

\* hour means 45 minutes

# Effects

Code	Content
BTj_K3_K01	The graduate is ready to proper storage of data, updating and extending knowledge on topics related to biotechnology and the related sciences;
BTj_K3_K02	The graduate is ready to development and application of one's skills in practice (including communication, teamwork), which enable effective lifelong learning with respect to biological sciences;
BTj_K3_U01_inz	The graduate can utilise proper techniques and knowledge related to biotechnology in practice, under the care of a supervisor;
BTj_K3_U21	The graduate can coping with understanding, planning and analysing; being able to interpret and report biological data acquired while working individually and in a group;
BTj_K3_W04	The graduate knows and understands the necessity to use proper simple computational techniques (including statistical analysis, computational tools and computer software suites) for biological data