University of Gdańsk

Subject card

Subject name and code	The application of Geographic Information System (GIS) in nature research., PG_00146042						
Field of study	Biology						
Date of commencement of studies	October 2024		Academic year of realisation of subject	2026/2027			
Education level	undergraduate studies		Subject group	Optional subject group			
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	3		Language of instruction	Polish			
Semester of study	6		ECTS credits	2.0			
Learning profile	academic		Assessment form				
Conducting unit	Katedra Taksonomii Roślin i Ochrony Przyrody -> Faculty of Biology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr Magdalena Lazarus					
	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		10.0	10.0	50	
Subject objectives	Familiarization with Geographic Information Systems (GIS) and the possibilities of their practical use in the work of a naturalist. Acquiring the ability to solve basic problems in the field of spatial analysis using cartographic modeling. Acquiring skills in working with a GPS device.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLL3_W12] The graduate knows and understands the principles of using IT tools for data analysis and interpretation of natural phenomena and processes	The student describes the principles of using Geographic Information Systems data analysis and interpretation of natural phenomena and processes.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[BIOLL3_K03] The graduate will be able to organise the work of a small team and work effectively as part of a team	The student is able to organize the work of a small team and demonstrates the ability to work effectively in a team.	[SK8] observation of student's independent or team work
[BIOLL3_U05] The graduate will be able to synthesise data from a variety of sources and draw appropriate conclusions	The student synthesizes data from various sources (botanical and zoological data, habitat properties, location of protected areas) and draws appropriate conclusions on this basis.	[SU6] demonstration of practical skills [SU8] observation of student's independent or team work
[BIOLL3_U04] The graduate will be able to apply statistical methods and computer algorithms and techniques to the description of phenomena and the analysis of biological data	The student applies basic statistical methods, algorithms and IT techniques such as map algebra, data interpolation methods to describe phenomena and analyze biological data.	[SU6] demonstration of practical skills [SU8] observation of student's independent or team work
[BIOLL3_W10] The graduate is familiar with the development and current state of knowledge and the latest trends in biology, as well as their relationship with other natural disciplines	The student is aware of the development and current state of knowledge as well as the latest trends in biology and indicates their relationship with other natural science disciplines such as: cartography, computer science.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[BIOLL3_U03] The graduate, under the guidance of a mentor, is able to carry out simple tasks or research expertise typical of the biological sciences	The student carries out simple projects in GIS systems, including completing typical databases used to collect natural data for nature conservation purposes.	[SU6] demonstration of practical skills [SU8] observation of student's independent or team work
[BIOLL3_K04] The graduate is ready to take responsibility for their own work and to follow the rules of teamwork and responsibility for shared tasks	The student is aware of responsibility for their own work and readiness compliance with the principles of teamwork and taking responsibility for tasks jointly carried out.	[SK8] observation of student's independent or team work

Subject contents

Work with QGIS and ArcGIS software. Definition and properties of maps. Geographic coordinate system and cartographic projection systems. Methods of preparing maps and presenting data. Properties of digital maps. Spatial data models and sources of data acquisition. Software modules and their use. Selection of visualization methods. Basic functions of vector and raster data analysis.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Practical skills test (ArcGIS).	51.0%	50.0%
Practical skills test (QGIS).	51.0%	50.0%

Recommended reading

Basic literature	1. Urbański J. 2008. GIS w badaniach przyrodniczych. Wyd. UG. Gdańsk.2. Pasławski J. 2010. Wprowadzenie do kartografii i topografii. Wyd. Nowa Era, Warszawa.
Supplementary literature	1. Longley P.A., Goodchild M.F., Maguire D.J., Rhind D.W. 2008. GIS Teoria i praktyka. PWN, Warszawa2. Urbański J. 1997. Zrozumieć GIS. Analiza informacji przestrzennej. PWN, Warszawa.3. Manikowska-Ślepowrońska B., Lazarus M., Żółkoś K., Zbyryt A., Kitowski I., Jakubas D. Influence of landscape features on the location of grey heron Ardea cinerea colonies in Poland. C. R. Biologies 339 (2016) 507516
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	1. Preparing a map according to the given example. 2. Calculation of the area of forests/lakes/length of rivers occurring in a precisely defined area.
Work placement	Not applicable

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