University of Gdańsk

Subject card

Subject name and code	Information Technologies - laboratory, PG_00194270		
Field of study	Geography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
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	1	Language of instruction	Polish polish
Semester of study	1	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Urban Environmental Research Laboratory (Coastal Cities Living Lab-CCLL) -> Department of Hydrology -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Maciej Markowski	
	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	2.0	18.0	50

Subject objectives

The aim of the course is to equip students with practical skills in working with digital data, both in terms of file management and data processing in spreadsheets. Students become familiar with various data formats, conversions, and basic and advanced methods of data analysis. Additionally, the exercises cover the creation of vector and raster graphics, as well as a review of selected mobile applications used for acquiring and processing geospatial data.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GEOGRL3-U09] is able to work in a group and take on various roles within it, look after the equipment entrusted to them, and ensure their own safety and that of others.	The student works effectively in a group, taking on different roles within the team, and takes care of assigned resources and computer equipment; they adhere to safety rules when working with data, software, and mobile applications.	[SU2] presentation/project/paper/ report
[GEOGRL3-U04] can apply field and laboratory methods and research tools, spatial analysis methods, and methods of presenting research results in the field of geography, assess their usefulness for tasks in which the application goal of geography can be realized	The student uses IT tools for data processing and analysis, including spreadsheets, vector and raster graphics, and mobile applications; they are able to assess the suitability of each tool for carrying out analytical tasks and presenting research results in the field of geographical sciences.	[SU5] implementation of a problem task
[GEOGRL3-U03] can plan and conduct, independently and as part of a team, simple research in the field of geography under the supervision of a scientific advisor, based on the necessary information from professional literature and other sources	The student plans and conducts simple geographical studies using digital data, both individually and in a team, based on professional literature, various data formats, and mobile sources; they are able to prepare analyses and visualize the results in graphical or tabular form.	[SU5] implementation of a problem task

Subject contents	1. File and Data Management organizing folders and files, relative and absolute paths, copying, moving, packaging, and archiving data; best practices in managing IT projects. 2. Flowcharts and Algorithms introduction to representing processes and data in flowcharts; designing simple algorithms and developing logical, analytical thinking. 3. File Formats and Data Conversions overview of commonly used data formats (e.g., KML, SHP, GPX, GML, XML, CSV, TSV, XLS, XLSX, GeoJSON, DWG) and their structures; practical data conversion and import/export in spreadsheets and other applications. 4. Basic Data Analysis in Spreadsheets using MS Excel and free alternatives to enter, organize, and perform basic data analysis. 5. Advanced Data Analysis in Spreadsheets applying functions, formulas, pivot tables, charts, and macros for more complex data analysis. 6. Vector Graphics creating and editing vector graphics using free software, including preparing diagrams and data visualizations. 7. Raster Graphics basics of editing and processing raster graphics, creating data visualizations, and preparing graphic materials using free tools. 8. Overview of Mobile Applications and Geospatial Data introduction to selected mobile applications for acquiring and analyzing geospatial data; integrating mobile data with spreadsheets.
Prerequisites and co-requisites	Knowledge in the field: basic information in the field of computer science. Skills: using a computer, ability to navigate software running on the Windows operating system.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
project or presentation	51.0%	40.0%
practical exercises	51.0%	60.0%

Recommended reading

Basic literature

- Cieśla K., 2021, Inkscape. Podstawowa obsługa programu. wydanie II rozszerzone i uzupełnione. Helion, Warszawa.
- Witkowski B., 2019,. GIMP. Poznaj świat grafiki komputerowej. Helion, Warszawa.
- Wrotek W., 2022, ABC Excel 2021 PL, Helion.
- Krok E., Stempnakowski Z., Podstawy algorytmów. Schematy blokowe. Wydawnictwo DIFIN.

Supplementary literature

- Wrotek W. Office 2021 Pl, 2022, Kurs. Helion.
- Curtis D. Frye, Microsoft Office 2007 Krok po Kroku, 2007. Wydawnictwo RM.
- Ściężor T., Technologia Informacyjna dla studentów Inżynieria Środowiska Politechniki Krakowskiej, 2016, Politechnika Krakowska.
- Abd-Elhamid Hany F., Zeleňáková Martina, Barańczuk Jacek [i in.], 2023 , Historical trend analysis and forecasting of shoreline change at the Nile Delta using RS data and GIS with the DSAS tool, Remote Sensing, vol. 15, nr 7, s.1-21, Numer artykułu:1737.

eResources addresses

Example issues/ example questions/ tasks being completed

- How can a flowchart support the design of a data processing and analysis workflow (e.g., for tabular or geospatial data)?
- What are the basic differences between selected file formats (e.g., CSV, XLSX, XML, GeoJSON, SHP), and in which situations should each of them be used?
- Which spreadsheet functions and tools enable data analysis and visualization of results in the context of geographical research?

Work placement

Not applicable

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