University of Gdańsk

Subject card

Subject name and code	Topography and GIS - field training, PG_00193806						
Field of study	Geography						
Date of commencement of studies	October 2027		Academic year of realisation of subject	2027/2028			
Education level	Bachelor's studies		Subject group	Obligatory subject group in the field of study Subject group related to scientific research 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			
Semester of study	2		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	30.0	0.0	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 develop practical skills in field measurements, the use of GIS tools, and the integration of spatial data. Students will learn to perform elevation and positional measurements, use GPS receivers and mobile applications for collecting field data, as well as model terrain surfaces and update digital maps. The course is designed to prepare students for independently planning and conducting spatial analyses, presenting results in map form, and working in teams while adhering to safety rules and proper use of equipment.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GEOGRL3-W02] knows and understands key concepts and theories in geography, as well as advanced processes and phenomena related to spatial diversity and the distribution of processes and phenomena on the Earth's surface at various spatial scales, particularly in Poland	The student understands fundamental geographic processes and phenomena and their spatial distribution, and can analyze them at different spatial scales using positional and elevation measurements, topographic data, and digital terrain models.	[SW1] oral statement/ conversation/discussion
[GEOGRL3-W06] knows advanced methods of acquiring, processing, and compiling geographic environmental data, as well as methods of analyzing and interpreting such data	The student acquires, processes, and analyzes spatial and elevation data from various sources, including field measurements, GPS/GNSS data, mobile applications, as well as raster and vector layers, creates digital terrain models, and interprets results in the context of terrain morphology and spatial processes.	[SW1] oral statement/ conversation/discussion
[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 applies field and office methods, including GIS tools and surveying equipment, conducts spatial analyses, and prepares presentations of results, including updating topographic data and DEMs, while assessing the suitability of different methods for practical tasks.	[SU5] implementation of a problem task [SU6] demonstration of practical skills
[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 can work effectively in a team, take on different roles during field exercises, ensure personal and group safety, and take care of assigned surveying equipment and GPS measurement tools.	[SU8] observation of student's independent or team work
[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 basic positional and elevation surveys in the field using surveying and digital methods, both individually and in a team, while also consulting professional literature.	[SU5] implementation of a problem task [SU6] demonstration of practical skills

Subject contents

1. Elevation and positional surveys using surveying techniques
2. Measurements using GPS and mobile applications
3. Terrain surface modeling using various existing data sources
4. Updating digital topographic maps and integrating multiple data sources
5. Final project: visualization, data analysis, comparative analysis, and final report

Prerequisites and co-requisites

Completion of GIS and Remote Sensing

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
final project	51.0%	70.0%
oral answer	51.0%	30.0%

Recommended reading

Basic literature

- Medyńska-Gulij B., 2021, Kartografia i geomedia, Wydawnictwo PWN, Warszawa.
- Pasławski J. (red.), 2010, Wprowadzenie do kartografii i topografii. Wydawnictwo Nowa Era Redakcja Kartograficzna.
- Urbański J., 2011, GIS w badaniach przyrodniczych. Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk.
- Jagielski A., 2025, Rysunki geodezyjne z elementami topografii i kartografii. Wydawnictwo Geodpis.

	Supplementary literature	• Walczak S., 1993, Geodezyjne ćwiczenia polowe. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 1993. • Pelczar M., Szeliga J., Ziółkowski J., Zarys kartografii i topografii. Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk, 1991. • Barańczuk J., Borowiak D. (red), Atlas jezior Zaborskiego Parku Krajobrazowego, Pomorski Zespół Parków Krajobrazowych i Katedra Limnologii UG, Gdańsk, 2010. • Jagelski A., Geodezja I. Wydawnictwo GEODPIS, Kraków, 2005.
	eResources addresses	
Example issues/ example questions/ tasks being completed	• What are the basic differences between leveling and tachymetric measurements, and in which situations is each method used? • What are the main available sources of DEM (Digital Elevation Model) data in Poland? • What factors affect the accuracy of GPS/GNSS measurements in the field?	
Work placement	Not applicable	

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