1.	Field of study	Geography
2.	Faculty	Faculty of Natural Sciences
3.	Academic year of entry	2022/2023 (winter term), 2023/2024 (winter term), 2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

Module: Unmanned aerial vehicle: environmental applications - basic level

Module code: W2-GF-S2-228

1. Number of the ECTS credits: 2

2. Learning outcomes of the module

code	description	learning outcomes of the programme	level of competence (scale 1-5)
W2-GF-S2-228_1	The student has basic knowledge of the Unmanned Aerial Vehicle (UAV) and their advantages and disadvantages of using them in the science and industry.	KGG2_U04 KGG2_W02	3 4
W2-GF-S2-228_2	The student is able to plan and implement the flight mission keeping the rules of the safety and legal regulations. The student is able to analyze and interpret spatial data and formulate appropriate conclusions based on them.	KGG2_K02 KGG2_U01 KGG2_U03 KGG2_U05	2 2 4 3

3. Module description

Description	The course is to enable students to acquire basic knowledge about the possibility of using Unmanned Aerial Vehicle (UAV) in science and industry. The student will get knowledge about the requirements regarding safety, legal regulations and usage techniques of UAV. During the course, students will participate in the measurements (planning and implementation of the flight mission for photogrammetric purposes) and data analysis (orthophoto and DEM generation with and without Ground Control Points (GCP), Dense Cloud Classification and 3D Model Reconstruction).
Prerequisites	Credit for the course: Applications of Global Navigation Satellite Systems (GNSS) 04-GG2-1108

4. Assessment of the learning outcomes of the module

code	type	description	learning outcomes of the module
W2-GF-S2-228_w_1	Written test	Verification of knowledge acquired by the student during lectures and studying recommended bibliography.	W2-GF-S2-228_1

W2-GF-S2-228_w_2	Project	Verification of knowledge and skills based on studies carried out during the classes.	W2-GF-S2-228_2

5. Forms of teaching

code	form of teaching			required hours of student's own work		assessment of the learning outcomes of the module
	type	description (including teaching methods)	number of hours	description	number of hours	
W2-GF-S2-228_fs_1	lecture	Lecture on the basics of the UAV, measurement techniques and law regulations.	10	Work with the recommended literature of the subject.	15	W2-GF-S2-228_w_1
W2-GF-S2-228_fs_2	laboratory classes	Performing by the student work related to the implementation of the projects including measurement sessions, data processing and presentation, analysis of the outputs referred to selected environmental issues.	30	Development of a flight plan, preparation of a UAV for the flight, implementation of safety procedures, participation in measurements, data analysis and preparation of a report including discussion of results and conclusions.	20	W2-GF-S2-228_w_2