



Subject card

Subject name and code	Environmental physics laboratory, PG_00037302						
Field of study	Technical Physics						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group		Optional subject group 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	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Katedra Fizyki Atomowej, Molekularnej i Optycznej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Mateusz Zawadzki				
	Teachers		dr hab. Mateusz Zawadzki				
Lesson types and methods of instruction	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	<p>The aim of the course is to acquaint a student with selected physical processes in environment and acquisition of skills in the field measurements.</p> <p>By participating in the laboratory and field classes the student acquires skills of specialist measuring instruments.</p>						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W07] Has knowledge of the construction and operation of physical instruments, measurement and research equipment.		The student learns the principles of operation of theodolite, leveling agent, sextant, magnetometer, ionizing radiation detector and other measuring devices		[SW1] Assessment of factual knowledge		
	[K6_W12] Knows basic health and safety rules.		The student applies to the principles of health and safety while performing environmental measurements.		[SW1] Assessment of factual knowledge		
	[K6_W08] Has knowledge of planning and conducting physical experiments, and critical analysis of its results.		Student is capable of planning and carrying out the experiment in the field		[SW1] Assessment of factual knowledge		
	[K6_U04] Can plan and conduct experiments, critically analyze their results, draw conclusions and form opinions. Has laboratory work experience.		Is able to plan and carry out environmental measurements of physical quantities using the corresponding instruments.		[SU1] Assessment of task fulfilment		
Subject contents	<p>Sun (construction, nuclear fusion reactions, chemical composition, interaction with the Earth) Processes and physical effects associated with the impact of the Sun-Earth Earth (shape and structure of the Earth, physical models used to describe the structure of the Earth, isostasy, seismology, seismic waves) The winds in the atmosphere</p>						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		50.0%	100.0%
Recommended reading	Basic literature	Boeker E., van Grondelle R., (2002) <i>Fizyka środowiska</i> . PWN, Warszawa. Sellers W.D., (1965) <i>Physical Climatology</i> . University of Chicago Press, Chicago. Stacey F.D., (1992) <i>Physics of the Earth</i> . Brookfield Press, Kenmore, Aust	
	Supplementary literature	1. W. Kosiński, "Geodezja", Wydawnictwo Naukowe PWN, Warszawa 2010. 2. J. Rogowski, M. Kłęk, Skrypt - Geodezja wyższa i astronomia geodezyjna, Uczelnia Warszawska im. Marii Skłodowskiej-Curie, Warszawa, 2009. 3. M. Barlik, A. Pachuta, "Geodezja fizyczna i grawimetria geodezyjna. Teoria i praktyka", Politechnika Warszawska, 2007. 4. Instrukcja techniczna G-4, "Pomiary sytuacyjne i wysokościowe", Wydanie Trzecie, Rozporządzenie Ministra Spraw Wewnętrznych i Administracji z dnia 24 marca 1999r. (Dz. U. Nr 30, poz. 297) Wykaz standardów technicznych - poz. 7, PWN, Warszawa 2001. 5. Norma branżowa BN-78/8770-07.	
	eResources addresses	Adresy na platformie eNauczanie: Laboratorium fizyki środowiska - Moodle ID: 45838 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=45838	
Example issues/ example questions/ tasks being completed	Working with a precision laser leveling - determination of the amount of selected control points (field measurements) Calculating the azimuth of the coordinates and work with precision electronic theodolite - determination of coordinates based on field measurements Gaining practical skills in the use of sextant, learning methods for determining the geographical position using the position of the sun.		
Work placement	Not applicable		

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