

1.	Field of study	Mathematics
2. Faculty Faculty of Science and Technology		Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	first-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7. General information about the	General information about the module		
Module name	Physics lab I, part 1		
Module code	W4-MT-S1-23-PF1		
Number of the ECTS credits	2		
Language of instruction	Polish		
Purpose and description of the content of education	Wykonanie zestawów ćwiczeń, które uczą studenta prowadzenia badań metodami fizycznymi, zrozumienia zjawisk fizycznych z zakresu mechaniki, elektryczności i magnetyzmu. Student ma możliwość doświadczalnego potwierdzenia teoretycznej wiedzy nabytej na warsztatach. Potrafi wykonać, opisać i zinterpretować pomiary podstawowych wielkości fizycznych. Wykorzystuje metody statystycznej analizy błędów pomiarowych do opracowania danych eksperymentalnych. Potrafi samodzielnie zaplanować i zaprojektować układ pomiarowy z wykorzystaniem materiałów codziennego użytku, wykonać pomiary z jego wykorzystaniem i opracować wyniki. Posiada umiejętność samodzielnego pogłębiania wiedzy fizycznej. Tematy ćwiczeń laboratoryjnych zostaną podane przez prowadzącego.		
List of modules that must be completed before starting this module (if necessary)	not applicable		

8. Learnir	ing outcomes of the module				
Code	Description	Learning outcomes of the programme	Level of competent (scale 1-5)		
PF1_01	Posiada podstawową wiedzę z poszczególnych działów fizyki klasycznej obejmującą: mechanikę, elektryczność i magnetyzm	KN_F_W01 KN_F_W02 KN F_W03	5 5 5		
PF1_02	Potrafi przeprowadzić proste pomiary i eksperymenty fizyczne oraz analizować ich wyniki	KN_F_U03 KN_F_U08 KN_F_W04 KN_F_W07 K_U43	5 5 5 5 3		
PF1_03	Umie wyjaśnić na gruncie praw fizyki i teorii fizycznych podstawowe zjawiska fizyczne obserwowane podczas wykonywania ćwiczeń laboratoryjnych	KN_F_U02 K_U43	5 3		
PF1_04	Zna podstawy statystyki i analizy danych	KN_F_U04 KN_F_W06	4 4		

PF1_05	Umie zastosować aparat matematyczny do rozwiązania prostych problemów fizycznych	KN_F_U03	5
		KN_F_U04	5
		KN_F_W06	5
PF1_06	Zna podstawowe zasady bezpieczeństwa i higieny pracy	KN_Ch_K02	4
		KN_F_W05	4

Code	Category	Name (description)				
a05	Lecture methods / expository methods	Explanation/clarification explication involving the derivation of a predetermined theorem from other, already known ones, in the number of steps specified by the person teaching the course				
b04	Problem-solving methods	Activating method – discussion / debate an exchange of views supported by substantive arguments leading to a clash of different views, a compromise or the identification of common positions; it proceeds according to previously agreed-upon rules regarding the time, manner and turn-taking as well as the principles of civil discourse; a discussion is not a competition but aims at finding the best solutions or presenting different points of view; its varieties include brainstorming, Oxford-style debate, panel discussion, decision tree, conference discussion; a debate is an orderly dispute between supporters and opponents of a viewpoint, usually specialists in the field or pre-selected representatives of a group dealing with a common problem				
c07	Demonstration methods	Screen presentation a presentation of synthetic image content using computer graphics, e.g., a series of slides or other multimedia forms, usually accompanied by a commentary; typical components of a screen presentation include text organized into bulleted points, charts, images and animations, sometimes sound effects or music; a multimedia illustration of course content presented in the form of a projected image				
d01	Programmed learning methods	Working with a computer e.g., Webquest; implementation of educational tasks using electronic and digital devices, computer programs and Internet applications; the academic teacher acts as a consultant; students' work is carried out step by step according to the plan laid own by the person teaching the course and following his instructions, and proceeds towards producing the indicated results within the set deadline				
d02	Programmed learning methods	Working with a programmed textbook working with a textbook containing instructional material covering part of or the entire curriculum of the module as well as a formula for studying the content; includes working with a subject textbook, an atlas, a catalogue, a problem book, etc.				
d03	Programmed learning methods	Working with another teaching tool e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools				
e01	Practical methods	Laboratory exercise / experiment [also conducted as fieldwork] a method of practical application of knowledge; implemented in three stages: the recognition of a problem induced by the task content, the formulation of the problem and the attempt to solve it accompanied by the assessment of the effects; the goal is to acquire skills, abilities and habits, and to consolidate the acquired knowledge so that it becomes operational; the laboratory method assumes greater independence of learners than carrying out an experiment				
e06	Practical methods	Observation also conducted as fieldwork; a method of watching phenomena, objects or people in a systematic/planned way in order to gain knowledge about them; perceptual separation of elements of a model action as an element of learning through imitation; a complex system of cognition based on sensory experiences				
f01	Methods of self-learning	Self-education				

		a method which involves independent acquisition of knowledge, skills and social competences, extending their scope and quality; complementary to the learning process taking place in class; taking on the task of developing and adjusting qualifications on one's own; self-study
f02	g	Individual work with a text searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue
f03		Conceptual work a (mainly intellectual) activity carried out independently (or in a selected group) resulting in the creation of a concept, idea or project; creating a plan based on a vision; developing a general outline of a project; producing a simplified sketch of the variant versions of a procedure/product/work

10. Forms of teach	Forms of teaching					
Code	Name		Assessment of the learning outcomes of the module	Learning outcomes of the module	Methods of conducting classes	
PF1_fs_01	laboratory classes	30			a05, b04, c07, d01, d02, d03, e01, e06, f01, f02, f03	

11. The studer	1. The student's work, apart from participation in classes, includes in particular:		
Code	Category	Name (description)	Is it part of the BUNA?
a02	Preparation for classes	Literature reading / analysis of source materials reading the literature indicated in the syllabus; reviewing, organizing, analyzing and selecting source materials to be used in class	No
a03	Preparation for classes	Developing practical skills activities involving the repetition, refinement and consolidation of practical skills, including those developed during previous classes or new skills necessary for the implementation of subsequent elements of the curriculum (as preparation for class participation)	No
a04	Preparation for classes	Consulting materials complementary to those indicated in the syllabus agreeing on materials complementary to those indicated in the syllabus, supporting the implementation of tasks resulting from or necessary for class participation	Yes
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes	No
b03	Consulting the curriculum and the organization of classes	Consulting the schedule getting acquainted with the class schedule, possibly in the presence of the year tutor, in order to optimize participation in classes, including those supplementary to the core subjects listed in the pursued study programme	Yes
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes devising a task implementation strategy embracing the division of content, the range of activities, implementation time and/or the method(s) of obtaining the necessary materials and tools, etc.	Yes
c02	Preparation for verification of learning outcomes	Studying the literature used in and the materials produced in class exploring the studied content, inquiring, considering, assimilating, interpreting it, or organizing knowledge obtained from the literature, documentation, instructions, scenarios, etc., used in class as	Yes

		well as from the notes or other materials/artifacts made in class	
d01	Consulting the results of the verification of learning outcomes	Analysis of the corrective feedback provided by the academic teacher on the results of the verification of learning outcomes reading through the academic teacher's comments, assessments and opinions on the implementation of the task aimed at checking the level of the achieved learning outcomes	Yes
d02	Consulting the results of the verification of learning outcomes	Development of a corrective action plan as well as supplementary/corrective tasks reviewing and selecting tasks and activities enabling the elimination of errors indicated by the academic teacher, their verification or correction resulting in completing the task with at least the minimum passing grade	Yes

Information on the details of the module implementation in a given academic year can be found in the syllabus available in the USOS system: <a href="https://usosweb.us.edu.pl">https://usosweb.us.edu.pl</a>.