



## Subject card

Subject name and code	Physical lab, PG_00047925						
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Zakład Spektroskopii Układów Złożonych -> Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Brygida Mielewska				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	15.0	0.0	0.0	15
	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	15		2.0		33.0	50
Subject objectives	Students are familiarized with the mathematical description of physical phenomena and they have to perform experiments regarding chosen physical problems. Students are taught how to apply physical phenomena in engineering and technology. Students are taught data acquisition as well as data and error analysis followed by drawing proper conclusions.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions		studets is able to carry out the series of measurements according to the given tutorial		[SU1] Assessment of task fulfilment		
	[K6_U02] can perform tasks related to the field of study in an innovative way as well as solve complex and nontypical problems, applying knowledge of physics, in changing and not fully predictable conditions		student is able to present the results of measurements in form of tabels and graphs, to analyse the results and draw conclusions		[SU5] Assessment of ability to present the results of task		
Subject contents	Main topics of experiments:  - Study of centrifugal force, - Study of simple and damped harmonic motion, - Determination of time in collision, - Measurement of the velocity of sound, - Determination of dielectric constant, - Study of the Earth's magnetic field, - Determination properties materials by electromagnetic waves, - Analysis of emission spectra of gases.						
Prerequisites and co-requisites	Students know basic physical laws, they can measure physical quantities using basic measuring tools, and they are able to perform analysis of errors.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Tests	100.0%	40.0%
	Reports	100.0%	40.0%
	Organization of experiments	100.0%	20.0%
Recommended reading	Basic literature	1. M. Zubek "Experiments in physic" 2. Halliday, Resnick, Walker - "Fundamentals of physics"	
	Supplementary literature	1. K. A. Tsokos - "Physics for IB diploma".	
	eResources addresses	Adresy na platformie eNauczanie: Pracownia Fizyczna I - IBM FMed 2022/23 - Moodle ID: 26681 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26681">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26681</a>	
Example issues/ example questions/ tasks being completed	1) Explain the origin of emission spectrum of atomic hydrogen.  2) What is the method of simple linear regression?		
Work placement	Not applicable		