

Subject card

Subject name and code	Physics laboratory exercises, PG_00092774						
Field of study	Marine Hydrography						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2024/2025		
Education level	Bachelor's studies	Subject group			Obligatory subject group 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			1.0		
Learning profile	practical	Assessment form					
Conducting unit	Laboratory of Physical Oceanography -> Department of Physical Oceanography and Climate Research -> Faculty of Oceanography and Geography -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor	dr Jordan Badur					
	Teachers	dr Jordan Badur dr inż. Grzegorz Cerkowniak					
Lesson types	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						
	eNauczanie source addresses: Moodle ID: 12831 ATC-WOiG-OCEAN-L3DZ-(2024/2025) Niepewności błędów pomiarowych https://mdl.ug.edu.pl/course/view.php?id=12831						
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		3.0		12.0	30
Subject objectives	<ol style="list-style-type: none"> Familiarization with basic processes and phenomena in Physics, their laws and research methods, using measurement techniques Transfer of knowledge and development of skills necessary for effective learning in subsequent courses on marine physics and hydrography in terms of measurement techniques necessary for setting up and performing experiments in Physics and Hydrography 						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[HML3-W04] the issue of measurements related to the exploration of sea basins and inland waters and tools allowing to describe, interpret and present the results of measurements	Students are acquainted with the methods of conducting experiments in Physics, as well as with the tools used in the process.	[SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task
	[HML3-U01] plan and conduct experiments, including computer simulations, interpret the results obtained and draw conclusions	Students have the ability to plan and conduct experiments, utilizing basic statistical methods to analyze and interpret the collected data.	[SU5] implementation of a problem task [SU6] demonstration of practical skills
	[HML3-U14] use the applicable terminology in presenting and discussing problems related to the field of study	Students demonstrate fluency in the use of terminology and methods of Physics relevant to the experiment performed.	[SU1] oral statement/conversation/ discussion
	[HML3-U19] plan and implement independent learning and improvement of his/her professional competences	Students are capable of planning self-study sessions.	[SU1] oral statement/conversation/ discussion [SU5] implementation of a problem task
	[HML3-W03] directions of development and the latest discoveries in the field of scientific disciplines forming the theoretical basis appropriate to the field of study	Students are familiar with recent paradigms in the theory of measurements in Physics.	[SW5] implementation of a problem task
	[HML3-W01] selected facts, phenomena and processes, as well as methods and theories concerning them, explaining the complex relationships between them, constituting basic general knowledge in the field of scientific disciplines forming the theoretical foundations specific to the field of study	Students have deep knowledge and understanding of the phenomena underlying the experiment.	[SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task
	[HML3-U08] independently use the professional literature available in traditional and electronic form, make an assessment, critical analysis and synthesis as well as the correct interpretation of the information obtained	Students are able to collect information on the phenomena underlying the experiment.	[SU1] oral statement/conversation/ discussion [SU5] implementation of a problem task
	[HML3-U18] work individually and in team, manage the work of the team, in particular comply with health and safety regulations and ergonomics	Students work together during experiments, conscious of their responsibility for the tasks they perform.	[SU5] implementation of a problem task [SU6] demonstration of practical skills
	[HML3-K01] correctly identify and resolve professional dilemmas, especially in the aspects of security and entrusted property	Students ensure the safety of both individuals and equipment during laboratory sessions.	[SK8] observation of student's independent or team work
[HML3-K02] correctly determine the priorities in professional work for the implementation of a task specified by himself/ herself or others	Students have the ability to complete assigned tasks in a timely manner.	[SK5] implementation of a problem task	
Subject contents	The theory of laboratory measurement, measurement uncertainty and statistical data analysis. Students will conduct experiments on selected topics from mechanics, heat and the macroscopic properties of materials.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	graded preparation for class	51.0%	40.0%
	graded laboratory report	51.0%	60.0%

Recommended reading	Basic literature	<p>Samuel J. Ling, Moebs W., Sanny J., University Physics (in Polish), OpenStax Polska, 2018</p> <p>Halliday D., Resnick R., Walker J.: Fundamentals of Physics - vol.1. Mechanics (in Polish). Wydawnictwo Naukowe PWN, 2007</p> <p>Halliday D., Resnick R., Walker J.: Fundamentals of Physics - vol.2. Mechanics, oscillations and waves, thermodynamics (in Polish), Wydawnictwo Naukowe PWN, 2007</p> <p>Halliday D., Resnick R., Walker J.: Fundamentals of Physics - vol. 3. Electricity and magnetism (in Polish). Wydawnictwo Naukowe PWN, 2007</p> <p>Halliday D., Resnick R., Walker J.: Fundamentals of Physics - vol.4 Electromagnetical waves, optics and relativity theory (in Polish). Wydawnictwo Naukowe PWN, 2007.</p>
	Supplementary literature	<p>Massel S. R.: Hydrodynamical processes in marine ecosystems (in Polish). Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2010. Orear J.: Physics (in Polish). Vol.1-2. WNT, Warszawa 2008</p>
	eResources addresses	
Example issues/ example questions/ tasks being completed	Determination of friction coefficient and the analysis of measurement uncertainty	
Work placement	Not applicable	

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