University of Gdańsk

Subject card

Subject name and code	Fundamentals of Physics - lecture, PG_00132594		
Field of study	Criminology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	Master's studies	Subject group	Optional subject group
Mode of study	part-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Faculty of Law and Administration -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Anna Synak	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	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	0.0	35.0	50

Subject objectives

Objectives of the course:

- learning the basic laws and principles of physics.

- learning the physical phenomena underlying physicochemical research in forensics,

- learning various physical quantities, their units and physical terminology,

- learning how to formulate research problems in commissioned expert opinions in the language of physics.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[KRYMMU2_KK01] The graduate is aware of the level of his/her knowledge and skills, and also understands the need of lifelong learning	The student is able to independently assess the value of expert report results. The student – as a future client of expert reports – is able to start a scientific conversation between experts and representatives of the justice system. He/she has knowledge of physics, enabling him/her to understand the methods used by the expert to perform the expert reports ordered. He/she knows the physical basis of operation of equipment used in various expert tests in forensics. He/she develops logical, creative and critical thinking. He/she is introduced to teamwork, he/she acquires the ability to discuss and precisely formulate statements.	[SK1] oral statement/conversation/ discussion
	[KRYMMU2_UW01] The graduate utilizes theoretical knowledge in the field of criminology and the related scientific disciplines to analyze and interpret problems connected with widely understood crime	The Student is able to apply knowledge of physics to describe and analyze the results of physical and physicochemical measurements. He/she has the ability to present them clearly. He/she verifies the credibility of information obtained from various sources based on known laws and principles of physics. He/she is able to critically select various pieces of information based on the laws of physics learned and recognizes the importance of physics for forensics. He/she is able to propose an appropriate research method to verify a specific problem.	[SU5] implementation of a problem task
	[KRYMMU2_WG01] The graduate demonstrates widened knowledge about legal science and related penal sciences, their the place in the system of sciences and mutual relation	The student has knowledge of the basics of physics necessary to understand various phenomena in nature and information presented in other subjects provided for in the course of study. Has basic knowledge of the principles and laws of physics and understands their importance not only for physics, but also for other sciences and knowledge of the world. Knows the basics of physics in the following areas of physics: 1. Measurement of physical quantities, units; 2. Interactions in nature; 3. Work. power and energy; 4. Vibrations and waves; 5. Gravity 6. Elements of thermodynamics; 7. Motion and its causes; 8. Atom and atomic nucleus; 9. Electricity and magnetism, elements of optics. 10. Elements of hydrostatics and hydrodynamics.	[SW4] test/exam - oral or written

Subject contents	Due to the addressees of the lecture, mathematical derivations of the laws and principles of physics have been omitted, while the relationships between various physical quantities and the analysis of physical phenomena in terms of their usefulness and use in various physical and physicochemical studies used in expertise will be emphasized.Lecture topics:Kinematics and dynamics of a material point and a rigid body. Conservation principles: momentum, angular momentum, energy. Vibrations and waves. Elements of fluid mechanics. Thermodynamics of physical processes. Electromagnetism: electric and magnetic properties of matter, electric and magnetic fields, electromagnetic waves. Geometrical and wave optics. Atomic and molecular physics: structure of atoms, atomic and molecular spectra, principle of laser operation. Elements of nuclear physics: properties of atomic nuclei, radioactivity.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">not applicable</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>written exam</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Holliday D.: Resnick R.: Walker J., Principles of physics, John Wiley&Sons</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">R.P Feynman, R.B. Leighton, M.Sands, Feynman Lectures on Physics, 1-3,Basic Books

Atkins P.W., Physical Chemistry, Oxford University Press

J.F Shelley, Engineering Mechanics:Statics and Dynamics, McGraw-Hill Inc.,US</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3"></td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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