

Subject card

Subject name and code	Physic with elements of biophysics, PG_00154254						
Field of study	Medical Biology						
Date of commencement of studies	October 2025	Academic year of realisation of subject			2026/2027		
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	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			2.0		
Learning profile	academic	Assessment form			credit		
Conducting unit	Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Donata Figaj				
	Teachers						
Lesson types	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		6.0		14.0	50
Subject objectives	1. Learning the most important laws of physics and the rules governing the underlying chemical reactionsbiological processes and physical properties of elements and chemical compounds. 2. Understandingbasic biophysical processes. 3. Ability to perform and interpret independentlybiophysical experiences.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOLMEDL3_U01] uses basic apparatus and research tools and, maintaining the correct sequence of operations, performs simple physical, biological or chemical observations and measurements in laboratory work in the biological or medical sciences	The student is able to use basic laboratory equipment and research tools, maintaining the correct sequence of activities, in order to perform simple physical, biological or chemical observations and measurements in laboratory work in the field of biological or medical sciences.	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report [SU8] observation of student's independent or team work
	[BIOLMEDL3_W16] explains the theoretical basis of experimental methods and lists the most important techniques of biological sciences that can be applied to medical biology and diagnostics	The student is able to explain the theoretical basis of experimental methods and list the most important biological science techniques that may be used in medical biology and diagnostics.	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report
	[BIOLMEDL3_W15] describes the principles of evaluating processes and phenomena occurring in a living organism, using physical or chemical measurements	Using physical or chemical measurements, the student is able to correctly assess the processes and phenomena occurring in a living organism.	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report
	[BIOLMEDL3_W10] understands and describes the physicochemical and biological basis of health sciences	The student understands and is able to describe the physicochemical and biological basis of health sciences.	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report
	[BIOLMEDL3_W09] identifies the tools of mathematics necessary to understand the laws of nature and to describe the processes of life	The student knows the most important laws and rules of physics and chemistry that underlie biological processes and knows the properties of chemical compounds and elements.	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report
	[BIOLMEDL3_K05] jest odpowiedzialny za bezpieczeństwo pracy własnej i innych oraz potrafi rozpoznać sytuacje zagrożenia i podjąć odpowiednie działania	The student is responsible for the safety of his/her work and that of others while staying in the laboratory room. He can also recognize a threat and respond to it appropriately.	[SK8] observation of student's independent or team work
	[BIOLMEDL3_W08] identifies the tools of mathematics necessary to understand the laws of nature and to describe the processes of life	The student knows the necessary mathematical tools needed to understand the laws of nature and describe life processes.	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report
Subject contents	Experimental introduction to selected physical issues (fluorescence, spectroscopyabsorption, calorimetry, enthalpy, refractometry, sedimentation). Learning and using techniquesbiophysical in biology.		
Prerequisites and co-requisites	Solving biochemical tasks (converting concentrations, preparing solutions, calculating solution concentrations, mixing solutions).		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	report from laboratory classes	0.0%	17.0%
	test	50.0%	83.0%
Recommended reading	Basic literature	1. Biofizyka, collective work edited by Zofia Józwiak and Grzegorz Bartosz, PWN, 20082. Principles of fluorescence spectroscopy, 3rd edition, Joseph Lakowicz, Springer Science, 20063. Biophysics. Selected issues with exercises. Z. Józwiak, G. Bartosz, PWN, Warsaw, 2005	
	Supplementary literature	Physical chemistry. Short lectures. A.G. Whittaker, A. R. Mount, M. R. Heal, PWN, Warsaw 2003;	
	eResources addresses		

Example issues/ example questions/ tasks being completed	1. Direct and indirect calorimetry2. Sedimentation centrifugation3. Jabłoński's diagram4. Exaltation of molar refraction5. Protein denaturation6. Enthalpy and entropy
Work placement	Not applicable

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