University of Gdańsk

Subject card

Subject name and code	Biophysics of Biological Systems, PG_00182155		
Field of study	Medical Physics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study 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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	2.0
Learning profile	academic	Assessment form	exam
Conducting unit	Division of Biomaterials and Medical Physics -> Institute of Experimental Physics -> Faculty of Mathematics, Physics and Informatics -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Justyna Strankowska	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	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	0.0	30.0	60

Subject objectives

The course objective is to introduce students to topics related to the physical description of biological systems. This includes:

- Understanding the structure and function of living matter from a physical perspective.
- Presenting the physical principles of measurement methods used in biophysics.

An additional goal of the course is for students to acquire the skills to apply the laws of physics and research techniques to describe biological systems. This includes the ability to independently design experiments involving living matter.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[FIZMEDL3_W06] Knows and understands at an advanced level key concepts of human anatomy and physiology, with a particular focus on the physical aspects of biological systems.	The student: Describes the structure and function of cells, tissues, and organs using the laws of physics.	[SW4] test/exam - oral or written
[FIZMEDL3_W01] Knows and understands at an advanced level the phenomena, principles, laws and theories specific to physics and biophysics.	The student: Explains the physical principles, as well as the operating procedures and applications of research methods used to study biological systems.	[SW4] test/exam - oral or written
[FIZMEDL3_W02] Knows and understands to an advanced level selected biological phenomena and processes, as well as the laws of physics and chemistry underlying them.	The student: Defines ways of describing living matter and knows the types of interactions within living matter. Describes the structure of chemical molecules that constitute living matter. Knows and understands the electrochemical processes occurring in the cell membrane. Describes the structure and function of cells, tissues, and organs using the laws of physics.	[SW4] test/exam - oral or written

Subject contents

1. Introduction to the description of living matter (characteristics of biological systems: proteins, lipids, DNA, RNA).
2. Elements of molecular biophysics: types of interactions in living matter and the formation of biological structures, kinetics of chemical reactions.
3. Cellular biophysics.
4. Tissue biophysics.
5. Organ biophysics.
6. Research methods used to study biological systems (XRD, UV-Vis, Raman and IR spectroscopy, NMR).

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
xam with open-ended questions	51.0%	100.0%

Recommended reading

Basic literature	not applicable
Supplementary literature	not applicable
eResources addresses	

Example issues/ example questions/ tasks being completed

not applicable

Work placement

Not applicable

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