University of Gdańsk

Subject card

Subject name and code	Photobiology, PG_00196951		
Field of study	Biotechnology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study 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	academic	Assessment form	credit
Conducting unit	Laboratory of Photobiology and Molecular Diagnostics -> UG Institute of Biotechnology -> Intercollegiate Faculty of Biotechnology UG-MUG -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Joanna Nakonieczna, prof. UG	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	16.0	0.0	0.0	0.0	0.0	16

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	16	5.0	29.0	50

Subject objectives

To familiarize students with biological phenomena at the molecular level, occurring under the influence of light, in order to demonstrate their relevance to biotechnology, medicine and their connection with other fields and disciplines of science. To familiarize students with the concepts and terminology used in biotechnology, as well as the concepts of related scientific fields and disciplines. To characterize modern research tools and measurement methods used in biotechnology and related scientific fields and disciplines;

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOTECHL3_W09] The graduate possesses structured and advanced knowledge of the terminology and concepts used in biological and medical sciences and related disciplines.	The student has advanced knowledge of research techniques and tools used in biotechnology.	[SW4] test/exam - oral or written
[BIOTECHL3_W07] The graduate has advanced knowledge of the rules of operation and the possibilities of using research techniques and tools used in biotechnology.	The student understands biological phenomena at the molecular level occurring under the influence of light, knows their significance for biotechnology, medicine and connections with other fields and disciplines of science connections with other fields and disciplines of science.	[SW4] test/exam - oral or written
[BIOTECHL3_W01] The graduate possesses structured and advanced knowledge of biological phenomena at the molecular level and understands their importance for biotechnology.	The student knows and understands the concepts and terminology used in biological and medical sciences and concepts from related scientific disciplines.	[SW4] test/exam - oral or written

Subject contents

1. Photochemistry and photophysics, light dosimetry, 2. reactive oxygen species, light-dependent signaling pathways3. interaction of light with biological tissues, mainly with skin,4. photosensitizing compounds natural and synthetic,5. molecular basis of cellular response to photodynamic therapy, light-induced damage to biomolecules in microorganisms and multicellular organisms,6. photochemical internalization, photodynamic therapy (PDT) in medicine, PDT in dermatology, PDT and immunology, antimicrobial effects of PDT.

Prerequisites and co-requisites

Knowledge of high school biology, chemistry, physics

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written test	51.0%	100.0%

Recommended reading

Basic literature	A. Literature required for final credit for the course: G. Stochel, Z. Stasicka, M. Brindel, W. Macyk, K. Szaciłowski, Bioinorganic Photochemistry, Wiley, Chichester, 2009.A. Graczyk, Fotodynamiczna metoda rozpoznawania i leczenia nowotworów, Dom Wydawniczy Bellona, Warszawa, 1999.
Supplementary literature	1. used in class 2. studied independently by the student 3. the latest published materials indicated by the lecturer
eResources addresses	

Example issues/ example questions/ tasks being completed

Work placement

Not applicable