

Subject card

Subject name and code	Photobiology, PG_00197655						
Field of study	Biotechnology						
Date of commencement of studies	October 2025	Academic year of realisation of subject			2027/2028		
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			1.0		
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				
	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 the basic 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 basic 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_W07] The graduate has advanced knowledge of the rules of operation and the possibilities of using research techniques and tools used in biotechnology.	understands the basic 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.	knows and understands the basic concepts and terminology used in biological and medical sciences and concepts from related scientific disciplines	[SW4] test/exam - oral or written
	[BIOTECHL3_W09] The graduate possesses structured and advanced knowledge of the terminology and concepts used in biological and medical sciences and related disciplines.	Has knowledge of basic research techniques and tools used in biotechnology	[SW4] test/exam - oral or written
Subject contents	1. basics of photochemistry and photophysics, light dosimetry, 2. reactive oxygen species, light-dependent signaling pathways, 3. 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
	exam	51.0%	100.0%
Recommended reading	Basic literature	A. Literatura wymagana do ostatecznego zaliczenia zajęć (zdania egzaminu): 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		

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