University of Gdańsk

Subject card

Subject name and code	Monographic lecture - Introduction into photochemistry, PG_00021578						
Field of study	Chemical Business						
Date of commencement of studies	February 2025		Academic year of realisation of subject	2025/2026			
Education level	Master's studies		Subject group	Obligatory subject group in the field of study Optional subject group			
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	3.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Faculty of Chemistry Office -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Janusz Rak				
	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		5.0		40.0	75
Subject objectives	Familiarizing students with the basic concepts and laws of photochemistry; developing the ability to describe photochemical processes and reactions and assess their potential practical applications.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BCHMU2_W01] Knows and understands complex physicochemical processes and is able to analyse their course in connection with other fields of science.	Has profound knowledge of the basic concepts, principles, and theories in photochemistry.	[SW4] test/exam - oral or written
[BCHMU2_U01] Is able to, on the basis of her/his knowledge, propose a solution to problems in chemistry, taking into account the economic aspect by using advanced measurement techniques.	Proposes solutions to photochemical problems using the knowledge acquired during the lecture.	[SU4] test/exam - oral or written
[BCHMU2_W05] Knows and understands the main trends in the development of chemistry combined with economics as two interpenetrating scientific disciplines.	Has knowledge about the directions of development and applications of photophysics and photochemistry.	[SW4] test/exam - oral or written
[BCHMU2_K04] Is willing to properly assess the acquired knowledge, respect and disseminate it in order to solve specific cognitive and practical issues.	Exercises caution and criticism in expressing opinions.	[SK4] test/exam - oral or written
[BCHMU2_U02] Is able to define her/his interests, develop them within the chosen direction and in connection with the subject of her/his master's thesis by implementing the process of self-education and planning her/his professional career.	Is aware of their knowledge and skills, understands the need for continuous professional development and personal growth, self-assesses their competencies, hones their skills, and sets directions for their own educational development.	[SU4] test/exam - oral or written

Subject contents

The interaction of electromagnetic radiation with matter, fundamental concepts and laws of photochemistry, excited states of molecules, the Jablonski diagram, radiative and non-radiative deactivation processes of the excited state, solvent effects, non-radiative intermolecular energy transfer, kinetics of photochemical reactions, basic types of photochemical reactions, photochemistry of nucleic acids and proteins, the process of vision, photosynthesis, apparatus and methods of photochemical research.

Prerequisites and co-requisites

Physical chemistry at the undergraduate level, spectrochemistry, and the ability to describe a chemical reaction in terms of thermodynamics and kinetics, knowledge of the basics of molecular spectroscopy.

Assessment methods and criteria

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

Recommended reading

Basic literature	1. S. Paszyc, Podstawy fotochemii, PWN, Warszawa, 1981. 2. J. P. Simons, Fotochemia i spektroskopia, PWN, Warszawa, 1976. 3. J. A. Barltrop, J. D. Coyle, Fotochemia. Podstawy, PWN, Warszawa, 1987 4. P. Suppan, Chemia i Światło, PWN, Warszawa, 1997
Supplementary literature	1. K. Pigoń, Z. Ruziewicz, Chemia Fizyczna. Fizykochemia molekularna, PWN, Warszawa, 2005
eResources addresses	

Example issues/ example questions/ tasks being completed

1. The importance of photochemical reactions.
2. Molecular factors affecting the probability of electronic transitions.
3. Basic photochemical laws.
4. Jablonski diagram.
5. Mechanisms of excited state quenching.

Work placement

Not applicable

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