University of Gdańsk

Subject card

Subject name and code	Monographic lecture - Introduction into photochemistry, PG_00082381		
Field of study	Chemistry		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
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	4	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
[CHEMMU2_W11] Demonstrates general knowledge about the current trends in the development of chemistry as a science and the latest discoveries in this field.	Possesses knowledge about the directions of development and applications of photophysics and photochemistry.	[SW4] test/exam - oral or written
[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	Explains and describes the processes of radiative and nonradiative deactivation of the excited state, characterizes the processes of electron and energy transfer in excited states, and identifies the basic types of photochemical reactions.	[SW4] test/exam - oral or written
[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	Exercises caution and criticism when expressing opinions.	[SK4] test/exam - oral or written
[CHEMMU2_W01] Uses knowledge of spectroscopic methods of chemical compound analysis.	Has general knowledge of the fundamental concepts, principles, and theories operating in photochemistry.	[SW4] 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.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">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.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>test</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">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</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. K. Pigoń, Z. Ruziewicz, Chemia Fizyczna. Fizykochemia molekularna, PWN, Warszawa, 2005</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">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.</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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