



Subject card

Subject name and code	Photochemistry, PG_00037383						
Field of study	Chemistry						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2024/2025		
Education level	first-cycle 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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Inorganic Chemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Agnieszka Pladzyk				
	Teachers		dr hab. inż. Agnieszka Pladzyk				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	15.0	45
	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	45		5.0		25.0	75
Subject objectives	Student acquires basic knowledge about the various physical, chemical and biological processes induced by electromagnetic radiation and the practical use of such processes in modern technologies, medicine and environmental protection.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W03		The student has knowledge of the structure of matter and the resulting properties that can be used in technologies based on photochemical processes in the purification of the environment from pollution		[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
	[K6_U01] knows how to get information from literature, databases and other sources, can integrate the information obtained, interpret and critically evaluate it, and draw conclusions, and to formulate and justify the opinions		The student is able to review the literature and other sources, both in Polish and English, on a given topic concerning the role of light in various chemical processes. The student is able to interpret properly these data, conclude and develop a multimedia presentation on a given topic.		[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		
	[K6_K07] is aware of his social role as a graduate of a Technical University, especially in presenting information and opinion to the public about the risks and opportunities posed by chemical sciences; undertakes actions to communicate such information in a comprehensible manner		Student is aware of the role of a social college graduate; understands the need to formulate and communicate to the public information and opinions concerning the technique and other aspects of the engineer's activity also through the mass media; It endeavors to convey such information and opinions in a universally understandable manner. Student also understands the need to update knowledge on the use of light in application technologies		[SK4] Assessment of communication skills, including language correctness [SK2] Assessment of progress of work		

Subject contents	Fundamental principles and concepts of photochemistry - excited states, Franck-Condon rule, Jabłoński diagram, selection rules, quenching of excited states. Photochemical reactions in solutions, quantum yield of photochemical reactions, actinometry. Atmospheric chemistry. Applied photography - photochemical synthesis industrial, photochromism, photolithography, OLEDs, optical brighteners. Photopolymerization - photopolymerization and photodegradation of polymers, polymerization photoinitiators. Photochemical methods of storing solar energy. Photochemistry in biology and medicine - vision process, UV filters, phototherapy. Application of photochemical processes in environmental protection.		
Prerequisites and co-requisites	Knowledge of subjects: physics, inorganic chemistry, organic chemistry, physical chemistry, biochemistry		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	seminar: multimedia presentation of given problem	60.0%	50.0%
	lecture: written test	60.0%	50.0%
Recommended reading	Basic literature	1. Paul Suppan "Chemia i światło" PWN Warszawa 1997. 2. Stefan Paszyc "Podstawy fotochemii" PWN Warszawa. 1992 3. "Fotochemia polimerów. Teoria i zastosowanie" Praca zbiorowa pod red, J. Pączkowskiego Wydawnictwo UMK 2003. 4. Zofia Stasicka "Procesy fotochemiczne w środowisku" Wydawnictwo UJ 2001.	
	Supplementary literature	1. C. E. Wayne, R. P. Wayne "Photochemistry" Oxford University Press 2005. 2. Nicholas J. Turro "Modern Molecular Photochemistry" University Science Books, CA 1991 3. J. A. Baltrop, J. D. Coyle "Fotochemia, Podstawy" PWN Warszawa 1987.	
	eResources addresses	Adresy na platformie eNauczanie: 2024_2025_FOTOCHEMIA - Moodle ID: 41502 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=41502	
Example issues/ example questions/ tasks being completed	1. Jablonski diagram 2. Types of quenching of excited states 3. Photochemical processes occurring in the atmosphere 4. Photodegradation and photostabilization of polymers 5. Removal of environmental pollution using photochemical processes		
Work placement	Not applicable		

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