University of Gdańsk

Subject card

Subject name and code	Monographic lecture - Advanced oxidation precesses, PG_00080877		
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	Laboratory of Photocatalysis -> Department of Environmental Technology -> Faculty of Chemistry -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Adriana Zaleska-Medynska	
	Teachers	dr inż. Patrycja Jutrzenka Trzebiatowska	

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

To familiarize students with the mechanisms of degradation of pollutants in selected modern oxidation processes

To familiarize students with selected devices used to purify liquid and gaseous streams using AOP

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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.	independently plans research experiments and interprets the results, taking into account the acquired knowledge in the field of chemistry and economics	[SU1] oral statement/conversation/ discussion [SU5] implementation of a problem task
[BCHMU2_K04] Is willing to properly assess the acquired knowledge, respect and disseminate it in order to solve specific cognitive and practical issues.	It talks about technology issues and mechanisms of environmental degradation in understandable language, using correct nomenclature	[SK1] oral statement/conversation/ discussion [SK2] presentation/project/paper/ report [SK5] implementation of a problem task
[BCHMU2_W05] Knows and understands the main trends in the development of chemistry combined with economics as two interpenetrating scientific disciplines.	can independently describe existing problems regarding the impact of environmental degradation on economic aspects	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task
[BCHMU2_W01] Knows and understands complex physicochemical processes and is able to analyse their course in connection with other fields of science.	Plans, selects appropriate equipment and apparatus to perform experiments, analyzes results and presents conclusions	[SW5] implementation of a problem task
[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.	can independently search for and interpret the best scientific databases in the world	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report [SU5] implementation of a problem task

Subject contents

Characteristics and division of advanced oxidation methods (AOP). The mechanism of oxidation of pollutants in the wet air oxidation method and supercritical oxidation. Characteristics of chemical, photochemical and electrochemical processes for removing pollutants from water, soil and air. Production and use of modern materials with catalytic properties in AOP methods. The use of nanostructures in AOP methods. The use of ozonation for disinfection, removal of organic compounds from the water phase and deodorization of air streams.

Prerequisites and co-requisites

Assessment methods and criteria

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

Recommended reading

Basic literature	Barbusiński, Zaawansowane utlenianie ścieków przemysłowych, Politechnika Śląska, 2013r. Burczyk B. Zielona Chemia, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2006 Lewandowski W.M. Proekologiczne źródła energii odnawialnej, WNT W-wa 2001 Zarzycki R., Zaawansowane metody utleniania, Politechnika Wrocławska, Wrocław 2002
Supplementary literature	not required
eResources addresses	

Example issues/ example questions/ tasks being completed

oral examination

Work placement

Not applicable

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