

Subject card

Subject name and code	Monographic lecture - Advanced oxidation precesses, PG_00080877						
Field of study	Chemical Business						
Date of commencement of studies	February 2026		Academic year of realisation of subject		2026/2027		
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						
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_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
	[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_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_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_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
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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