

**Subject card**

<b>Subject name and code</b>	Monographic lecture – Application of oxidation processes in chemistry, PG_00082466						
<b>Field of study</b>	Chemical Business						
<b>Date of commencement of studies</b>	February 2025	<b>Academic year of realisation of subject</b>				2025/2026	
<b>Education level</b>	Master's studies	<b>Subject group</b>				Obligatory subject group in the field of study Optional subject group	
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>				at the university	
<b>Year of study</b>	1	<b>Language of instruction</b>				Polish	
<b>Semester of study</b>	2	<b>ECTS credits</b>				3.0	
<b>Learning profile</b>	academic	<b>Assessment form</b>				credit	
<b>Conducting unit</b>	Faculty of Chemistry -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		prof. dr hab. Ewa Siedlecka				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	30		20.0		25.0	75
<b>Subject objectives</b>	<p>presentation of the development of physicochemical research in solid and liquid phases over the last century, familiarization with basic instrumental methods used in the characterization of substances tested in scientific works, presentation of the diversity of scientific works carried out under the supervision of KChOiN employees, development of skills in independent planning of experimental work and solving problems, preparation for independent selection of scientific literature, leading consequently to preparation of a master's thesis</p>						

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.	Can classify radicals and radical reactions; divides AOP methods depending on the methods of generating hydroxyl radicals; lists the applications of radicals, chemical entities of an oxidizing-reducing nature and their reaction in environmental protection, medicine, chemical synthesis; can list the methods commonly used in the analysis and diagnostics of radical reactions; understands the description and course of AOP processes; characterizes and understands the electron transfer process; explains and interprets the relationships between the structure of a compound and its oxidizing-reducing activity.	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
	[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.	discusses the potential economic utility of using innovative methods using radicals and chemical entities of an oxidizing-reducing character Understands interpretations of results presented in scientific papers	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
	[BCHMU2_K04] Is willing to properly assess the acquired knowledge, respect and disseminate it in order to solve specific cognitive and practical issues.	can indicate the application nature of the discussed issues and analyzed critical events (cases);	[SK1] oral statement/conversation/ discussion [SK2] presentation/project/paper/ report
	[BCHMU2_W05] Knows and understands the main trends in the development of chemistry combined with economics as two interpenetrating scientific disciplines.	Understands interpretations of results presented in scientific papers	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
	[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.	shows connections between the topics presented in the lecture and life	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
Subject contents	Radicals and their types, radical reactions, the role of radical reactions in nature, division of advanced oxidation methods (AOP), methods of generating radicals and other chemical entities with oxidant and reductant characteristics, application of AOP in water treatment, application of AOP in wastewater treatment, application of reduction processes for fuel production, application of radicals in medicine, application of radicals in chemical synthesis, antioxidant activity of natural and synthetic compounds, including complex compounds, factors determining antioxidant activity of compounds.		
Prerequisites and co-requisites	knowledge of: general, inorganic, analytical and coordination chemistry; knowledge of instrumental methods for characterizing chemical substances; knowledge and ability to use computer programs: Microsoft Office package and Chem Office package		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	completing tasks assigned by the teacher	51.0%	80.0%
	activity during classes	51.0%	20.0%
Recommended reading	Basic literature	none	
	Supplementary literature	none	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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