


KAPITAŁ LUDZKI
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
 Unię Europejską w ramach
 Europejskiego Funduszu
 Społecznego

UNIA EUROPEJSKA
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Course title		ECTS code	
Monographic lecture – Application of oxidation processes in chemistry		13.3.1170	
Name of unit administrating study			
Faculty of Chemistry			
Studies			
faculty	field of study	type	drugiego stopnia
Wydział Chemii	Chemia	form	stacjonarne
		specjalty	chemia biomedyczna, chemia i technologia środowiska, analityka i diagnostyka chemiczna, chemia obliczeniowa
		specialization	wszystkie
Teaching staff			
prof. dr hab. inż. Lech Chmurzyński; dr Aleksandra Tesmar; dr hab. Joanna Makowska, profesor uczelni; dr hab. Dariusz Wyrzykowski; prof. dr hab. Ewa Siedlecka			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		3	
Lecture		classes - 30 h	
The realization of activities		tutorial classes – 10 h	
classroom instruction		student's own work – 35 h	
Number of hours		Total: 75 h - 3 ECTS	
Lecture: 30 hours			
The academic cycle			
2023/2024 winter semester			
Type of course		Language of instruction	
obligatory		polish	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
<ul style="list-style-type: none"> - critical incident (case) analysis - discussion - group work - multimedia-based lecture - problem-focused lecture 		Final evaluation	
		Graded credit	
		Assessment methods	
		<ul style="list-style-type: none"> - assignment work – project or presentation - graded course credit based on individual grades obtained during the semester 	
		The basic criteria for evaluation	
		positive assessment of the presentation and activity in discussions covering the subject	
Method of verifying required learning outcomes			
Required courses and introductory requirements			
A. Formal requirements			
general chemistry, inorganic chemistry, analytical chemistry, physical chemistry, organic chemistry			
B. Prerequisites			
Aims of education			
<p>presentation of the development of physicochemical research in solid and liquid phases over the last century,</p> <ul style="list-style-type: none"> • familiarization with the basic instrumental methods used in the characterization of test substances in scientific works, • presentation of the diversity of scientific works carried out under the supervision of KChOiN employees, • developing the ability to independently plan experimental work and solve problems • preparation for independent selection of scientific literature, leading consequently to the preparation of a master's thesis 			
Course contents			

<p>Radicals and their types, radical reactions, the role of radical reactions in nature, classification of advanced oxidation processes (AOP), methods generation of radicals and other chemical species of the nature of oxidants and reducing agents, the use of AOP in water treatment, the use of AOP in wastewater treatment, the use of reduction processes in the production of fuels, the use of radicals in medicine, the use of radicals in chemical synthesis, a review of the experimental methods used to study the antioxidant activity of natural compounds and synthetic compounds, including complex compounds, methods based on the HAT mechanism (hydrogen atom transfer), methods based on the mechanism SET (single electron transfer), electrochemical methods, factors determining the antioxidant activity of compounds</p>	
<p>Bibliography of literature</p> <p>Literature required to pass the course Extracurricular readings Literature provided by the teacher during the class</p>	
<p>The learning outcomes (for the field of study and specialization)</p>	<p>Knowledge</p> <p>Can classify radicals and radicals reactions; divides AOP methods depending on a method for generating hydroxyl radicals; lists the applications of radicals, redox chemical species and their reaction in environmental protection, medicine, chemical synthesis; can list methods commonly used in the analysis and diagnosis of radicals reactions; understands the description and the course of AOP processes; characterizes and understands the process of transfer electrons; explains the relationship between the structure of the relationship and its redox activity</p>
	<p>Skills</p> <p>understands the interpretation of the results presented in scientific works; shows connections between the topics presented during the lecture and life; can indicate the application nature of the discussed and analyzed issues cases study; discusses the potential economic usefulness of the application of innovative methods that use radicals and chemical species of redox nature</p>
	<p>Social competence</p> <p>Discusses in a group collaborates with the colleagues, assumes various social roles (leader or performer etc.)</p>
<p>Contact</p> <p>lech.chmurzynski@ug.edu.pl</p>	