


**KAPITAŁ LUDZKI**  
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez  
 Unię Europejską w ramach  
 Europejskiego Funduszu  
 Społecznego

**UNIA EUROPEJSKA**  
 EUROPEJSKI  
 FUNDUSZ SPOŁECZNY


<b>Course title</b>		<b>ECTS code</b>	
Monographic lecture – Application of oxidation processes in chemistry		13.3.1236	
<b>Name of unit administrating study</b>			
Faculty of Chemistry			
<b>Studies</b>			
<b>faculty</b>	<b>field of study</b>	<b>type</b>	drugiego stopnia
Wydział Chemii	Biznes chemiczny	<b>form</b>	stacjonarne
		<b>specjalty</b>	wszystkie
		<b>specialization</b>	wszystkie
<b>Teaching staff</b>			
prof. dr hab. inż. Lech Chmurzyński; prof. dr hab. Ewa Siedlecka; dr hab. Joanna Makowska, profesor uczelni; dr Aleksandra Tesmar; dr hab. Dariusz Wyrzykowski			
<b>Forms of classes, the realization and number of hours</b>		<b>ECTS credits</b>	
<b>Forms of classes</b>		3	
Lecture		classes - 30 h	
<b>The realization of activities</b>		tutorial classes – 10 h	
classroom instruction		student's own work – 35 h	
<b>Number of hours</b>		Total: 75 h - 3 ECTS	
Lecture: 30 hours			
<b>The academic cycle</b>			
2023/2024 winter semester			
<b>Type of course</b>		<b>Language of instruction</b>	
obligatory		polish	
<b>Teaching methods</b>		<b>Form and method of assessment and basic criteria for evaluation or examination requirements</b>	
<ul style="list-style-type: none"> <li>- critical incident (case) analysis</li> <li>- discussion</li> <li>- group work</li> <li>- multimedia-based lecture</li> <li>- problem-focused lecture</li> </ul>		<b>Final evaluation</b>	
		Graded credit	
		<b>Assessment methods</b>	
		<ul style="list-style-type: none"> <li>- assignment work – project or presentation</li> <li>- graded course credit based on individual grades obtained during the semester</li> </ul>	
		<b>The basic criteria for evaluation</b>	
		positive assessment of the presentation and activity in discussions covering the subject	
<b>Method of verifying required learning outcomes</b>			
<b>Required courses and introductory requirements</b>			
<b>A. Formal requirements</b> <b>B. Prerequisites</b> Required courses general chemistry, inorganic chemistry, analytical chemistry, physical chemistry, organic chemistry			
<b>Aims of education</b>			
Aims of education presentation of the development of physicochemical research in solid and liquid phases over the last century, <ul style="list-style-type: none"> <li>• familiarization with the basic instrumental methods used in the characterization of test substances in scientific works,</li> <li>• presentation of the diversity of scientific works carried out under the supervision of KChOiN employees,</li> <li>• developing the ability to independently plan experimental work and solve problems</li> <li>• preparation for independent selection of scientific literature, leading consequently to the preparation of a master's thesis</li> </ul>			
<b>Course contents</b>			
Radicals and their types, radical reactions, the role of radical reactions in nature, classification of advanced oxidation processes (AOP), methods			

<p>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><b>Bibliography of literature</b></p> <p>Bibliography of literature Literature required to pass the course Extracurricular readings Literature provided by the teacher during the class</p>	
<p><b>The learning outcomes (for the field of study and specialization)</b></p>	<p><b>Knowledge</b></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><b>Skills</b></p>
	<p><b>Social competence</b></p> <p>Discusses in a group collaborates with the colleagues, assumes various social roles (leader or performer etc.)</p>
<p><b>Contact</b></p> <p>lech.chmurzynski@ug.edu.pl</p>	