


KAPITAŁ LUDZKI
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
 Unię Europejską w ramach
 Europejskiego Funduszu
 Społecznego

UNIA EUROPEJSKA
 EUROPEJSKI
 FUNDUSZ SPOŁECZNY


Course title		ECTS code	
Chemical and radiochemical environmental analysis		13.3.0702	
Name of unit administrating study			
null			
Studies			
faculty	field of study	type	drugiego stopnia
Wydział Chemii	Chemia	form	stacjonarne
		specjalty	wszystkie
		specialization	wszystkie
Teaching staff			
prof. dr hab. Bogdan Skwarzec			
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 - 15 h	
classroom instruction		Student's own work - 30 h	
Number of hours		TOTAL: 75 h - 5 ECTS	
Lecture: 30 hours			
The academic cycle			
2023/2024 summer semester			
Type of course		Language of instruction	
obligatory		polish	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
multimedia-based lecture		Final evaluation	
		Graded credit	
		Assessment methods	
		written exam	
		The basic criteria for evaluation	
		Obtaining a positive assessment of the written credit consisting of open questions covering only the issues listed in the lecture	
Method of verifying required learning outcomes			
Required courses and introductory requirements			
A. Formal requirements			
The student should have completed a monographic lecture „Environmental radiochemistry and radiological protection” at the second degree studies			
B. Prerequisites			
Students are required to complete obligatory subjects: completion of first degree chemical studies with specialization in chemical analytics and diagnostics, food chemistry, cosmetics chemistry and environmental chemistry			
The monographic lecture is intended for students of chemistry of the second degree and specialization in chemical analytisc and diagnostics, environmental chemistry and environmental technology.			
Aims of education			
To familiarize students with the basics and methods of chemical and radiochemical analysis of the environmental.			
- To familiarize students with the applications of chemical and radiochemical analysis in studies of terrestrial and marine environment.			
- To familiarize students with the validation of chemical and radiochemical methods.			
Course contents			
Trace analysis in environmetal studies, research methods and technique.			

<p>Radioactive elements in nature, radiometry (gamma, beta and alpha spectrometry) and sources of radioactive contamination in the natural environment</p> <p>Validation in chemical and radiochemical analysis and criteria for evaluation of analytical results.</p> <p>Speciation and speciation analysis of toxic and radiotoxic elements.</p> <p>Determination of radioactive gamma, beta and alpha radionuclides in natural samples.</p>	
<p>Bibliography of literature</p> <p>Literature required to pass the course:</p> <p>Primary literature:</p> <p>A.1. Literature used during classes:</p> <ul style="list-style-type: none"> - Skwarzec B., Polon, uran i pluton w ekosystemie południowego Bałtyku, Rozprawy i monografie, 6, Instytut Oceanologii PAN, Sopot 1995. - Skwarzec B., Radiochemia środowiska i ochrona radiologiczna, Wydawnictwo DJ s.c, Gdańska, 2002. - Skwarzec B., Analysis of radionuclides, In: Handbook of trace analysis: fundamentals and applications, Ed: I. Baranowska, Springer, Switzerland, Charter 15, 431-453, 2015, ISBN 978-3-319-19613-8. <p>Literature for individual studies</p> <ul style="list-style-type: none"> - Analiza śladowa, pod redakcją I. Baranowskiej, Wydawnictwo MALAMUT, Warszawa, 2013. - G.W van Loon, S.J. Duffy: Chemia środowiska. Wydawnictwo PWN (2008). ISBN: 978-83-01-15324-3. <p>Extracurricular readings:</p> <p>Ćwiczenia rachunkowe z chemii analitycznej pod redakcją Z. Galusa, PWN, Warszawa 2009,</p> <p>M. Wesołowski, K. Szefer, D. Zimna – Zbiór zadań z chemii analitycznej, Warszawa 2002.</p> <p>A. Cygański, B. Ptaszyński, J. Krystek – Obliczenia w chemii analitycznej, WN-T, Warszawa 2000</p>	
<p>The learning outcomes (for the field of study and specialization)</p>	<p>Knowledge</p> <p>After completing the course, each student:</p> <ul style="list-style-type: none"> Defines basic concepts of chemical and radiochemical environmental analysis. Knows and understands analytical and spectroscopic methods used for the quantification of elements and radionuclides. Understands the concept and application of validation in environmental analysis and distinguishes and applies the basic criteria for assessing analytical results.
	<p>Skills</p>
	<p>Social competence</p> <p>After completing the course, each student:</p> <ul style="list-style-type: none"> Understands the need and further education in the field of chemical and radiochemical analysis. Knows the basic principles of safe work with toxic substances and radioactive isotopes. Makes the public aware of the impact of radioactivity and toxic substances on human life. Demonstrates the most independent, active approach to problems and creativity in independent and team work
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