


**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>	
Radionuclides in food		13.3.1225	
<b>Name of unit administrating study</b>			
null			
<b>Studies</b>			
<b>faculty</b>	<b>field of study</b>	<b>type</b>	second tier studies (MA)
Faculty of Chemistry	Chemical Business	<b>form</b>	full-time
		<b>specialty</b>	all
		<b>specialization</b>	all
Faculty of Chemistry	Chemistry	<b>type</b>	second tier studies (MA)
		<b>form</b>	full-time
		<b>specialty</b>	all
Faculty of Chemistry	Environmental Protection	<b>specialization</b>	all
		<b>type</b>	second tier studies (MA)
		<b>form</b>	full-time
		<b>specialty</b>	all
		<b>specialization</b>	all
<b>Teaching staff</b>			
dr hab. Dagmara Strumińska-Parulska, profesor uczelni			
<b>Forms of classes, the realization and number of hours</b>		<b>ECTS credits</b>	
<b>Forms of classes</b>		2 classes - 15 h tutorial classes - 15 h student's own work - 20 h TOTAL: 50 h - 2 ECTS	
Lecture			
<b>The realization of activities</b>			
classroom instruction, online classes			
<b>Number of hours</b>			
Lecture: 15 hours			
<b>The academic cycle</b>			
2023/2024 winter semester			
<b>Type of course</b>		<b>Language of instruction</b>	
an elective course		english	
<b>Teaching methods</b>		<b>Form and method of assessment and basic criteria for evaluation or examination requirements</b>	
Lecture based on the multimedia presentation		<b>Final evaluation</b>	
		Graded credit	
		<b>Assessment methods</b>	
		exam	
		<b>The basic criteria for evaluation</b>	
		The criteria according to UG regulations for students	
<b>Method of verifying required learning outcomes</b>			
<b>Required courses and introductory requirements</b>			
<b>A. Formal requirements</b>			
lack			
<b>B. Prerequisites</b>			
lack			
<b>Aims of education</b>			
Familiarize students with the topics of the course content.			
<b>Course contents</b>			

<p>Radiochemistry and radiation protection basics. Sources and distribution of natural and artificial radionuclides. Radiotoxicity and its groups. Dosimetry and its units. Radiation doses. Sources of radiochemical contamination and radiation doses evaluation. Food examples and their influence on the radiation dose. The Chernobyl and the Fukushima accidents and their influence on the food products. Monitoring of radioactive food contamination. Radiological effects of smoking cigarettes</p>	
<p><b>Bibliography of literature</b></p> <p>Literature required to pass the course</p> <p>Course content</p> <p>Frontasyeva M., Perelygin V., Vater P., Radionuclides and Heavy Metals in Environment, Springer, 2000</p> <p>Extracurricular readings</p> <p>Dahlgard H., Nordic Radioecology: The Transfer of Radionuclides through Nordic Ecosystems to Man, Elsevier, 1994,</p> <p>Magil J., Galy J., Radioactivity · Radionuclides · Radiation, Springer, 2005,</p> <p>-Steinhauser G., -Koizumi A., -Shozugawa K., Nuclear Emergencies, Springer, 2019</p>	
<p><b>The learning outcomes (for the field of study and specialization)</b></p> <p>Chemical Business:</p> <p>K_BChII_W03: knows and understands in-depth legal and administrative procedures in chemistry and correctly interprets their international dimension</p> <p>K_BChII_U02: is able to define his/her interests, develop them within the chosen field of study and in connection with the subject of the master's thesis by implementing the process of self-education and planning his/her professional career</p> <p>K_BChII_U03: is able to present, based on the current state of knowledge, scientific discoveries and the results of own research in the field of chemical and economic sciences, through skilful debate and public speeches</p> <p>K_BChII_K03: is willing to critically assess the level of his/her own knowledge in the light of the achievements of the studied scientific discipline</p> <p>K_BChII_K04: is willing to properly assess the acquired knowledge, respect it and disseminate it in order to solve specific cognitive and practical issues</p> <p>K_BChII_K05: is willing to act independently for the environment in order to fulfill certain social obligations</p> <p>Chemistry:</p> <p>K_W05: has extended knowledge in the field of the specialisation studied</p> <p>K_U03: finds necessary information in specialist literature, databases and other sources, lists basic scientific journals in chemistry</p> <p>K_U04: applies acquired knowledge of chemistry and related scientific disciplines</p> <p>K_U07: defines and implements the directions of own further education</p> <p>K_K01: knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so</p> <p>K_K03: understands the need for systematic work on various projects of a long-term nature and knows how to set priorities for the implementation of undertaken tasks</p> <p>K_K06: undertakes research tasks consciously and responsibly, understanding the social aspects of the practical application of the acquired knowledge and skills and the responsibility related to it</p> <p>Environmental Protection:</p> <p>K_OŚII_W03: characterises the effects of human interference in the natural environment and explains the</p>	<p><b>Knowledge</b></p> <ol style="list-style-type: none"> <li>1. knows and understands the basic concepts of radiochemistry, radiation protection and radiotoxicity,</li> <li>2. knows the natural and artificial radioactive elements in the environment and sources of their origin,</li> <li>3. understands the concept of radiotoxicity and knows its groups,</li> <li>4. has knowledge on the radiation dose and its units,</li> <li>5. has knowledge about the origin of radionuclides in the human body,</li> <li>6. understands the radiological effects of the accumulation of radionuclides by humans as a result of breathing, eating and smoking,</li> <li>7. knows the goals and tasks of environmental monitoring of the radioactive contamination.</li> </ol>
	<p><b>Skills</b></p> <ol style="list-style-type: none"> <li>1. understands the basic concepts of radiotoxicology and the importance of radiation protection,</li> <li>2. recognizes the most important natural and artificial radionuclides contained in man,</li> <li>3. can assess the radiological consequences of human intake of radionuclides from the air, water and food and as a result of smoking,</li> <li>4. is able to assess the radiation doses coming from ingested radionuclides,</li> <li>5. is able to assess the most important radioactive hazards for humans and knows how to reduce them,</li> <li>6. is able to assess radiological threats arising as a result of local or global contamination of radioactivity.</li> </ol>
	<p><b>Social competence</b></p> <ol style="list-style-type: none"> <li>1. understands the need for further education in the field of monitoring of radiochemical contamination of the food products,</li> <li>2. demonstrates creativity in limiting the absorption of radionuclides by humans and makes the society aware of the effects of excessive incorporation of radionuclides,</li> <li>3. can transfer knowledge in the society about sources of radiochemical contamination in building materials,</li> </ol>

mechanisms of reaction of living organisms to its pollution  
K\_OŚII\_U01: on the basis of the acquired knowledge,  
proposes to solve environmental problems  
K\_OŚII\_U05: searches, selects and analyses the literature  
achievements of environmental sciences, including  
scientific journals and databases, reading and  
understanding scientific texts in her/his native  
K\_OŚII\_K03: undertakes professional and personal  
challenges, shows activity, undertakes efforts and is  
characterized by perseverance in undertaking individual  
and team actions in the field of environmental protection  
K\_OŚII\_K10: has a need for continuous professional  
development

## Contact

dagmara.struminska@ug.edu.pl