

**Subject card**

<b>Subject name and code</b>	Radionuclides in food, PG_00171103						
<b>Field of study</b>	Chemical Business, Chemistry, Environmental Protection						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>				2027/2028	
<b>Education level</b>	Master's studies	<b>Subject group</b>				Optional subject group	
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>				at the university	
<b>Year of study</b>	2	<b>Language of instruction</b>				English	
<b>Semester of study</b>	3	<b>ECTS credits</b>				4.0	
<b>Learning profile</b>	academic	<b>Assessment form</b>				credit	
<b>Conducting unit</b>	Laboratory of Toxicology and Radiation Protection -> Department of Environmental Chemistry and Radiochemistry -> Faculty of Chemistry -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr hab. Dagmara Strumińska-Parulska				
	<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						
	Additional information: Lecture based on the multimedia presentation						
<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		50.0	100	
<b>Subject objectives</b>	Familiarize students with the topics of the course content.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEMMU2_U03] Finds necessary information in specialist literature, databases and other sources, lists basic scientific journals in chemistry.	1. can assess the radiological consequences of human intake of radionuclides from the air, water and food and as a result of smoking 2. is able to assess the radiation doses coming from ingested radionuclides, 3. is able to assess the most important radioactive hazards for humans and knows how to reduce them, 4. is able to assess radiological threats arising as a result of local or global contamination of radioactivity.	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report
	[CHEMMU2_U10] Reads with understanding scientific and popular science chemical texts in English.	understands and analyzes texts in English in the field of food radiochemistry	[SU1] oral statement/conversation/discussion
	[CHEMMU2_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.	can transfer knowledge in society about sources of radiochemical contamination in food and the presence of natural radionuclides in building materials	[SK1] oral statement/conversation/discussion
	[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	demonstrates creativity in limiting the absorption of radionuclides by humans and makes the society aware of the effects of excessive incorporation of radionuclides	[SK1] oral statement/conversation/discussion
[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	1. knows and understands the basic concepts of radiochemistry, radiation protection and radiotoxicity, 2. knows the natural and artificial radioactive elements in the environment and sources of their origin, 3. understands the concept of radiotoxicity and knows its groups, 4. has knowledge on the radiation dose and its units, 5. has knowledge about the origin of radionuclides in the human body, 6. understands the radiological effects of the accumulation of radionuclides by humans as a result of breathing, eating and smoking, 7. knows the goals and tasks of environmental monitoring of the radioactive contamination.	[SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report	
Subject contents	Radiochemistry and radiation protection basics. Sources and distribution of natural and artificial radionuclides. The most important natural and artificial isotopes affecting internal exposure. Radiotoxicity and its groups. Dosimetry and its units. Radiation doses. Methods for determining radionuclides. 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.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	discussion, activity	51.0%	50.0%
	presentation	51.0%	50.0%
Recommended reading	Basic literature	1. Frontasyeva M., Perelygin V., Vater P., Radionuclides and Heavy Metals in Environment, Springer, 2000	
	Supplementary literature	1. Dahlgaard H., Nordic Radioecology: The Transfer of Radionuclides through Nordic Ecosystems to Man, Elsevier, 1994, 2. Magil J., Galy J., Radioactivity · Radionuclides · Radiation, Springer, 2005, 3. -Steinhauser G., -Koizumi A., -Shozugawa K., Nuclear Emergencies, Springer, 2019	
	eResources addresses		

Example issues/ example questions/ tasks being completed	lecture content
Work placement	Not applicable

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