University of Gdańsk

Subject card

Subject name and code	Radiochemistry and radiation protection, PG_00170309						
Field of study	Chemistry, Environmental Protection						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2027/2028			
Education level	Bachelor's studies		Subject group				
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	2		Language of instruction	Polish			
Semester of study	4		ECTS credits	2.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Laboratory of Toxicology and Radiation Protection -> Department of Environmental Chemistry and Radiochemistry -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Dagmara Strumińska-Parulska					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours	Self-study	SUM	
	Number of study hours	30		5.0	15.0	50	
Subject objectives	Familiarizing students with all issues mentioned in the program content						

Learning outcomes			
	Course outcome	Subject outcome	Method of verification
	[OŚL3_K05] Identifies the level of her/his knowledge and skills, demonstrates the need to update knowledge about the environment and its protection, demonstrates the need for continuous professional training and personal development.	1. understands the need for further education in the field radiochemistry and radiology, 2. dispels public fears related to use radioactive substances, 3. makes society aware of the impact of radioactivity on human life, 4. presents ways reducing natural doses radiation resulting from the presence of radionuclides in air, food and materials construction	[SK5] implementation of a problem task
	[OŚL3_W05] Explains the course of natural and anthropopressional physical, chemical and biological processes and phenomena occurring in nature at various levels of matter organisation.	1. has knowledge about natural and artificial elements radioactive and their occurrence in nature 2. knows the impact of radiolysis processes water for human health and life, 3. has knowledge about genetics and somatic effects irradiation of the body man, 4. knows the views on influence small doses of radiation on man	[SW1] oral statement/ conversation/discussion
	[OŚL3_W08] Explains the mechanisms of economic and consumer pressure on the environment and recognises the possibilities of reducing it using the latest knowledge and scientific achievements.	1. has knowledge of application radionuclides in science, technology and medicine, 2. understands the dilemmas related to development of nuclear energy, 3. has knowledge about the effects on disaster environments in nuclear power plants in Chernobyl and Fukushima and knows methods of disposal radioactive waste	[SW1] oral statement/ conversation/discussion
	[OŚL3_W02] Characterises the relationships and relationships between various disciplines of natural sciences and science, uses knowledge of mathematics, physics, chemistry and biology in the description of basic concepts, concepts and principles in environmental protection.	1. defines basic concepts related to the structure of the nucleus atomic, particles elementary and processes taking place in the nucleus, 2. knows and understands the types of changes nuclear and has knowledge about radiometric methods used in radiochemistry, 3. understands the meaning radioactivity in synthesis chemical elements and development and evolution of life on Earth	[SW1] oral statement/ conversation/discussion
	[OŚL3_U04] Uses specialist language in the discussion and properly uses the nomenclature in the field of environmental protection and individual disciplines related to it.	knows how to use the nomenclature in the field of radiochemistry and radiological protection	[SU1] oral statement/conversation/ discussion [SU5] implementation of a problem task
Subject contents	Natural and artificial radioactivity. Spontaneous nuclear transformations. The alpha-beta-gamma theory of the synthesis of chemical elements. The influence of radioactivity on the development and evolution of life on Earth. Origin and occurrence of radioactive elements in nature. Radioactive activity and its units. Earth's radiological heat. Radiometric methods in radiochemical analysis. Interaction of ionizing radiation with matter. Radiation processes and radiolysis. The impact of small doses of ionizing radiation on humans. Radiation protection standards. Radiotoxicity and its groups. Isotope geochronology. The use of radioactive elements in science, technology and medicine. Origin of artificial radioactive elements in the environment. Venom weapon. Nuclear reactions as an energy source. Nuclear energy. Reactors and reactor processes. Nuclear power plant disasters in Chernobyl and Fukushima and their effects on the environment. Radioactive waste and methods of its disposal.		
Prerequisites and co-requisites			

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<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>preparation of a problem task</td><td>51.0%</td><td>50.0%</td></tr>
<tr><td>oral assessment, based on the student's activity</td><td>51.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>B. Skwarzec, Radiochemia środowiska i ochrona radiologiczna, Wydawnictwo DJ s.c, Gdańska, 2002
W. Szymański, Chemia jądrowa, PWN, Warszawa 1996
J. Sobkowski i M. Jelińska-Kaźmierczuk, Chemia jądrowa, Wydawnictwo Adamantan, Warszawa, 2006
A. Czerwiński, Chemia jądrowa i promieniotwórczość, Oficyna Edukacyjna Krzysztof Pazdro, Warszawa 1998</td></tr>
<tr><td>Supplementary literature</td><td>-</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">-</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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