

**Subject card**

<b>Subject name and code</b>	Radiochemistry of marine environment , PG_00179533						
<b>Field of study</b>	Chemistry, Environmental Protection						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>			2026/2027		
<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>	1	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	2	<b>ECTS credits</b>			2.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			credit		
<b>Conducting unit</b>	Faculty of Chemistry -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr hab. Dagmara Strumińska-Parulska				
	<b>Teachers</b>		dr hab. Dagmara Strumińska-Parulska				
<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						
<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		5.0		15.0	50
<b>Subject objectives</b>	familiarizing students with all the issues mentioned in the lecture program content						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[OŚMU2_W01] Describes complex phenomena and processes occurring in nature, including those related to the spread of anthropogenic pollution.	knows and understands basic concepts in the field of radiochemistry and radioecology of the sea; knows the types of living and non-living matter in the marine environment; has knowledge of natural and artificial radioactive elements in the marine environment,	[SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task
	[OŚMU2_U06] Defines her/his interests and develops them within the chosen specialisation and themes of her/his master's thesis while implementing the process of self-education and planning of own future career.	is able to define priorities in the implementation of undertaken tasks consciously and responsibly undertakes research tasks, understanding the social aspects of practical use of acquired knowledge and skills and the related responsibility	[SU5] implementation of a problem task
	[OŚMU2_K10] Has a need for continuous professional development.	knows the limitations of his/her own knowledge; understands the need for further education in marine radiochemistry and conducting research in this field	[SK1] oral statement/conversation/ discussion [SK5] implementation of a problem task
	[OŚMU2_K06] Recognises the importance of knowledge in solving encountered cognitive and practical problems and consults experts in the event of difficulties in solving a problem on her/his own.	understands the need to monitor radioactive contamination of the sea. is able to convey knowledge to the public about the sources and extent of radioactive contamination of the southern Baltic ecosystem,	[SK1] oral statement/conversation/ discussion
	[OŚMU2_W04] Chooses methods, techniques and research tools used in environmental protection.	knows the methods and methods of preparing marine samples for radiochemical analysis, knows radiometric methods	[SW5] implementation of a problem task
	[OŚMU2_W05] Describes development directions and the latest discoveries in the field of scientific disciplines related to environmental protection.	knows the concept of accumulation, bioindication and speciation of radioactive elements in the marine environment, knows and understands the importance of accumulation of radionuclides in Baltic organisms for assessing the radiation dose for consumers of seafood, has knowledge of the sources of radionuclides in the marine environment,	[SW1] oral statement/ conversation/discussion
Subject contents	Basic concepts in oceanography and radiochemistry. Nuclear reactions. Natural and artificial radioactive elements in the marine environment. Radioactive series and radioactive disequilibrium. Sources of radionuclides. Contamination of the marine environment after the nuclear disasters in Chernobyl and Fukushima. Radiochemical methods and radiometry in radiochemistry of the marine environment. The most important radionuclides in the seas and oceans. Processes affecting the distribution of radionuclides. Accumulation and distribution of radionuclides in aquatic organisms. Geochronology. Application of artificial radionuclides in environmental studies. Accumulation and distribution of radionuclides in aquatic organisms.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	activity	51.0%	50.0%
	case study	51.0%	50.0%
Recommended reading	Basic literature	Skwarzec B., Radiochemia środowiska, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk, 2021	
	Supplementary literature	Dahlgaard H., Nordic Radioecology: The Transfer of Radionuclides through Nordic Ecosystems to Man, Elsevier, 1994, Magil J., Galy J., Radioactivity · Radionuclides · Radiation, Springer, 2005, Steinhauser G., -Koizumi A., -Shozugawa K., Nuclear Emergencies, Springer, 2019	
	eResources addresses		
Example issues/ example questions/ tasks being completed	-		
Work placement	Not applicable		

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