University of Gdańsk

Subject card

Subject name and code	Radioactive Pollution Monitoring, PG_00167111						
Field of study	Nuclear safety and radiological protection						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2027/2028		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		5.0		
Learning profile	academic		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Bogdan Skwarzec				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	15.0	0.0	0.0	60
	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	60		0.0		65.0	125
Subject objectives	The aim of the course is to improve skills and familiarize students with all the issues mentioned in the lecture program content, especially tasks resulting from the international system for notifying about radiation incidents, nuclear accidents or radiation threats, as well as the management of radioactive waste.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BJORL3_U04] Can use mathematical and computer apparatus to analyze and solve problems in radiological protection and nuclear safety	Is able to analyze problems related to radiological protection and nuclear safety	[SU2] presentation/project/paper/ report [SU3] text preparation/written work [SU4] test/exam - oral or written
[BJORL3_K06] Is aware of professionalism and adherence to professional ethics	is aware of professional compliance with the principles of professional ethics	[SK2] presentation/project/paper/ report [SK3] text preparation/written work [SK4] test/exam - oral or written
[BJORL3_K05] Understands the need and importance of popularization related to radiological protection and nuclear safety	Understands and promotes radiological protection and nuclear safety	[SK2] presentation/project/paper/ report [SK3] text preparation/written work [SK4] test/exam - oral or written
[BJORL3_K01] knows the limitations of his own knowledge and understands the need for further education	Knowing what trends nuclear energy is undergoing, he understands the constant need for education	[SK2] presentation/project/paper/ report [SK3] text preparation/written work [SK4] test/exam - oral or written
[BJORL3_W06] knows the basic computational methods used to solve typical problems in radiological protection and nuclear safety	Knows computational methods for solving nuclear safety and radiological protection problems	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report [SW3] text preparation/written work
[BJORL3_U07] Knows how to present in an accessible way the latest developments in radiological protection and nuclear safety and can analyze their legal aspects	Knows new legal aspects in the field of radiological protection and nuclear safety	[SU2] presentation/project/paper/ report [SU3] text preparation/written work [SU4] test/exam - oral or written
[BJORL3_W01] has a general knowledge of the basic concepts and principles of nuclear physics and chemistry, understands their historical development and their importance not only for nuclear safety and radiation protection, but also for understanding the modern world; has a basic knowledge of biology and ecology	Knows the principles of nuclear physics and chemistry, has knowledge of biology and chemistry, and nuclear safety	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report [SW3] text preparation/written work
[BJORL3_W07] knows the construction and basic principles of operation of scientific apparatus used in radiological protection and aimed at ensuring nuclear safety	Knows and understands the operating principles of equipment used in radiological protection to ensure nuclear safety	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report [SW3] text preparation/written work
[BJORL3_W09] Has a basic knowledge of the legal and ethical considerations associated with professional activities	Understands and is able to use legal and ethical knowledge in professional activities	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report [SW3] text preparation/written work

Subject contents

Advantages and disadvantages of nuclear energy
History of the development of nuclear energy
Effective doses received for statistical inhabitants and their components
Why it's worth having nuclear energy
Radioactive contamination and methods of its detection
Impact of a nuclear power plant on the environment
Orphan sources
Radioactive series
Nuclear accidents and the international scale of nuclear events
Radiation sickness
Construction of a nuclear reactor and natural nuclear reactor
Methods of decommissioning a nuclear power plant
Radioactive waste, its classification and transport
Radioactive sources and their classification
Nuclear weapon
Monitoring of radioactive contamination in Poland (soil, water, food)
Radioactive contamination detection network
Continuous monitoring of the dose rate of gamma radiation and the content of radioactive elements in the environment and food products
Early contamination detection system and measurement facilities

Prerequisites and co-requisites

Before starting the course, the student should have mastered issues related to environmental radiochemistry and radiological protection

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written exam	51.0%	100.0%

Recommended reading	Basic literature	Bogdan Skwarzec, 2020, Environmental radiochemistry, UG Publishing House, Gdańsk, Areva (edited by Bertrand Barre), 2008, All about nuclear energy. From atom A to zirconium Zr, Communication Section of AREVA, translation by Marcin Rey, Leyko Publishing House, ISBN 978-83-933964-0-5 Jezierski Grzegorz, 2014, Nuclear chemistry yesterday and today, WNT Publishing House, Warszawa, ISBN 978-83-7926-297-7 Bogdan Skwarzec, 2002, Environmental radiochemistry and radiological protection, DJ Publishing House. Bogdan Skwarzec, 2005, Polonium, uranium and plutonium in the ecosystem of the southern Baltic Sea, Dissertations and monographs 6/1995, Institute of Oceanology of the Polish Academy of Sciences, ISBN 83-900555-5-4 Krzysztof Król, 2024, Radiation safety, PWN Publishing House, Warsaw, ISBN 978-83-01-23564-2 lecture notes Act of November 29, 2000, Journal of Laws 2023.1173
	Supplementary literature	lecture content available publications
	eResources addresses	
Example issues/ example questions/ tasks being completed	Classification of nuclear accidents into individual levels of the International Nuclear Emergency ScaleMonitoring of surface and water supply waters Measuring stations for detecting radioactive contamination networks Soil sampling measurement program Changes in monitoring Polish nuclear energy Improving monitoring of Polish nuclear energy Factors of destruction of nuclear weapons Intergovernmental organizations	
Work placement	Not applicable	

Document generated electronically. Does not require a seal or signature.