

Subject card

Subject name and code	Nuclear industry, PG_00080744						
Field of study	Chemical Business						
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	6		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Laboratory of Environmental Analytics and Radiochemistry -> Department of Environmental Chemistry and Radiochemistry -> Faculty of Chemistry -> Rector						
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	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	The aim of the course is to familiarize students with the lecture topics, which focus on participation in work related to the construction of Polish nuclear power plants. Involvement in this process means not only maintaining existing jobs and creating new ones, but also the possibility of a significant technological leap. This approach fully fits into the country's long-term economic development strategy						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[BCHINŻ_U05] Evaluates the usefulness and functioning of existing engineering and technical solutions as well as research and measurement methods in the chemical industry.		The student assesses the usefulness of research and measurement methods in the chemical industry		[SU3] text preparation/written work [SU4] test/exam - oral or written		
	[BCHINŻ_W01] Describes the relationship between the economy and the functioning of the chemical industry.		Understands the relationship between economics and the chemical industry		[SW4] test/exam - oral or written [SW3] text preparation/written work		
	[BCHINŻ_U08] Uses the chemical nomenclature and engineering terminology properly.		Understands and uses chemical and engineering nomenclature		[SU3] text preparation/written work [SU4] test/exam - oral or written		
	[BCHINŻ_W07] Describes the construction and operating principles of basic scientific, technological and control-measuring apparatus.		Knows the structure and principles of operation of scientific, technological and control and measurement equipment		[SW4] test/exam - oral or written [SW3] text preparation/written work		

Subject contents	Natural and artificial radioactivity. Radioactive decays and nuclear reactions. Interaction of ionizing radiation with matter. Dosimetry and radiological protection. Construction and types of nuclear reactors. Nuclear Energy and other energy technologies. Radioactive waste, their transport, processing and storage. Radioactive contamination of the environment and nuclear weapons. Application of radioactive nuclides in science, technology and the army. Legal aspects in the nuclear industry		
Prerequisites and co-requisites	nuclear chemistry and physics course		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written exam	51.0%	100.0%
Recommended reading	Basic literature Sobkowski J. Jelińska-Kaźmierczuk M., Nuclear chemistry, W-wo Adamantan, Warsaw 2006, ISBN: 83-7350-080-4 A.2. Szymański W., Nuclear chemistry, PWN Scientific Publishing House, Warsaw 1996, ISBN: 83-01-12053-3 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	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 science publications lecture notes
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Natural and artificial radioactivity 2. Principles of radiological protection, 3. Construction of a nuclear reactor 4. Nuclear energy and development of the energy industry 5. Processing and storage of radioactive waste 6. Sources of radioactive environmental contamination 7. Use of radionuclides in science, technology and military. 8. Legal aspects in the nuclear industry.	

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