University of Gdańsk

Subject card

Subject name and code	Nuclear industry, PG_00080744		
Field of study	Chemical Business		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
Education level	Bachelor's studies	Subject group	Obligatory subject group 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 Polish language
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_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
[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_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_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

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.	

Work placement	Not applicable

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