

**Subject card**

<b>Subject name and code</b>	The formation of chemical elements in nature, PG_00179521						
<b>Field of study</b>	Chemistry						
<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. Piotr Mucha				
	<b>Teachers</b>		dr hab. Piotr Mucha				
<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		7.0		18.0	55
<b>Subject objectives</b>	familiarizing students with the Big Bang theory familiarizing students with the origin of matter in the Universe familiarizing students with the structure of atoms familiarizing students with the formation and evolution of stars familiarizing students with the nucleosynthesis of elements in the Universe familiarizing students with the relationship between nucleosynthesis and the phenomenon of life						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEMMU2_W11] Demonstrates general knowledge about the current trends in the development of chemistry as a science and the latest discoveries in this field.	presents the latest discoveries concerning the synthesis of chemical elements	[SW4] test/exam - oral or written
	[CHEMMU2_U04] Applies acquired knowledge of chemistry and related scientific disciplines.	presents the nature of the structure of matter and chemical elements	[SU4] test/exam - oral or written
	[CHEMMU2_U10] Reads with understanding scientific and popular science chemical texts in English.	presents knowledge about the synthesis of elements in the Universe	[SU4] test/exam - oral or written
	[CHEMMU2_W02] Has extended and in-depth knowledge in the field of basic chemistry.	presents methods of nucleosynthesis of chemical elements	[SW4] test/exam - oral or written
	[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	presents the relationships between elemental composition and the functioning of living organisms	[SW4] test/exam - oral or written
	[CHEMMU2_U03] Finds necessary information in specialist literature, databases and other sources, lists basic scientific journals in chemistry.	presents the assumptions of the Big Bang theory	[SU4] test/exam - oral or written
	[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	demonstrates the ability to search publicly available sources of information	[SK4] test/exam - oral or written
[CHEMMU2_K05] Understands the need for independent search of information in scientific literature and popular science magazines.	presents information about the evolutionary paths of stars	[SK4] test/exam - oral or written	
Subject contents	the Big Bang theory, the origin of matter in the universe, structure of the Universe, the formation and evolution of stars, nucleosynthesis of elements in the universe, the relationship between nucleosynthesis and the phenomenon of life		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test questions	50.0%	100.0%
Recommended reading	Basic literature	S. Hawking Krótka historia czasu, Wyd. Zysk i S-ka, 2007 Chown Marcus "Magiczny Tygiel. O Pochodzeniu Atomów" Zysk i S-ka, 2004 Andrzej Kabziński Kosmochemia. Ewolucja i budowa Wszechświata, PWN, 2023	
	Supplementary literature	Murdin Paul, Wszechświat. Biografia, Prószyński Media, 2022	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. According to current knowledge, the smallest (indivisible) particles of matter are a. Atoms b. Neutrons c. Quarks d. Protons 2. The current age of the universe is estimated to be approximately (billion years) a. 4-5 b. 8-10 c. 13.5-14 d. 19-20		
Work placement	Not applicable		

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