University of Gdańsk

Subject card

Subject name and code	Evolution of Matter and Structure of the Universe, PG_00165959						
Field of study	Bioinformatics						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2028/2029			
Education level	Bachelor's studies		Subject group	Optional subject group			
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	3.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Piotr Mucha				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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		0.0	45.0	75	
Subject objectives	To familiarize students with the earliest stages of the formation and evolution of the UniverseTo familiarize students with the main theories, structure and principles governing the functioning of the UniverseTo familiarize students with the mechanisms of formation and evolution of matter in the Universe and their role in the origin of lifeTo familiarize students with the connection between the evolution of matter and the phenomenon of life						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOINL3_W02] Has advanced scientific knowledge necessary to understand the basic processes in living organisms.	Student: Characterizes the stages of evolution of the Universe Knows the basic theories that describe reality Characterizes the basic research techniques that make it possible to study the Universe Presents the stages of evolution of structures and matter in the Universe Knows the relationship between the evolution of matter and the phenomenon of life	[SW4] test/exam - oral or written
[BIOINL3_U02] Graduate is able to apply knowledge of natural sciences and science to formulate, analyze and solve problems related to bioinformatics	Student: uses scientific terminology to the extent necessary to present issues related to the formation and evolution of the Universe is able to present the stages of the evolution of the Universe and the methods of their study is able to present the basic theories describing the functioning of the Universe can present the process of formation and evolution of matter can correlate the evolution of matter in the Universe with the origin of living organisms Translated with DeepL.com (free version)	[SU4] test/exam - oral or written

Subject contents

Big Bang and evolution of the Universe, general theory of relativity and quantum mechanics, gravity, experimental methods for studying the Universe, microwave background radiation, evolution of matter, standard model, mass and the Higgs boson, dark matter and energy, galaxies, stars and planets-formation and structure, formation of elements and chemical compounds in the Universe, chemical composition of living organisms, future of the Universe

Prerequisites and co-requisites

Assessment methods and criteria

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

Recommended reading

Basic literature	S. Hawking Krótka historia czasu. Od Wielkiego Wybuchu do czarnych dziur, Wyd. Zysk i S-ka, 2015N. deGrasse Tyson, M. A. Strauss , J. R. Gott, Witamy we Wszechświecie. Podróż astrofizyczna, Wyd. Zysk i S-ka, 2019D. Goldsmith, N. deGrasse Tyson, Wielki początek. 14 miliardów lat kosmicznej ewolucji, Wyd. Prószyński i S-ka, 2009
Supplementary literature	Paul Davies Kosmiczna wygrana. Dlaczego Wszechświat sprzyja życiu?, Wyd. Prószyński i S-ka, 2008J. Baggott , Higgs. Odkrycie boskiej cząstki, Wyd. Prószyński i S-ka, 2014J. Baggott Początek. Naukowa historia stworzenia, Wyd. Prószyński i S-ka, 2016J. Challoner, Pierwiastki, czyli z czego zbudowany jest wszechświat, Wyd. Publicat, 2020
eResources addresses	

Example issues/ example questions/ tasks being completed	The main component of the Universe is:a. Baryonic matter (made up of protons and neutrons)b. Dark energyc. Microwave radiation (photons)d. Dark matter
Work placement	Not applicable

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