University of Gdańsk

Subject card

Subject name and code	Origin and evolution of life on Earth, PG_00021238						
Field of study	Chemistry						
Date of commencement of studies	October 2024		Academic year of realisation of subject	2025/2026			
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	2		Language of instruction	Polish			
Semester of study	3		ECTS credits	2.0			
Learning profile	academic		Assessment form	credit			
Conducting unit							
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	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	- to familiarize with the earliest stages of the formation of the Universe, the Milky Way, the Solar System and the Earth- to familiarize students with the mechanisms of abiotic fusion reactions- to familiarize students with the definitions and hypothesis of the origin of life on Earth based on the RNA world- to familiarize students with the stages of evolution of life on Earth						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEML3_U01] Identifies, analyses and solves problems in the field of broadly understood chemistry on the basis of the acquired knowledge.	presents the basic assumptions of the “RNA world” defines the catalytic properties of RNA and its role in the flow of genetic information	[SU4] test/exam - oral or written
[CHEML3_U09] Is able to learn independently.	understands the need for continuous education, demonstrates the ability to critically evaluate and analyze information on the evolution of the Universe and issues concerning the origin of life contained in the mass media	[SU4] test/exam - oral or written
[CHEML3_W05] Has basic knowledge of the chemical specialisation studied.	presents the biochemical basis of life	[SW4] test/exam - oral or written
[CHEML3_U02] Performs analyses using experimental methods and draws conclusions based on them.	presents the evolution of life on Earth can correlate environmental conditions with the possibility of the existence of life	[SU4] test/exam - oral or written
[CHEML3_W10] Enumerates and describes the basic aspects of the construction, operation and use of measuring apparatus and equipment used in experimental works in the field of chemistry and related sciences.	presents methods for studying the structure and history of the Universe	[SW4] test/exam - oral or written
[CHEML3_W01] Enumerates basic laws and theories in chemistry, physics, mathematics and biology.	presents the chemical reaction pathways of the prebiotic era	[SW4] test/exam - oral or written

Subject contents

Stages of the formation of the Universe, Milky Way and Solar System, characteristics of the primordial atmosphere of the Earth, abiotic synthesis of nucleotides, amino acids and RNA and proteins, chirality problem, structure of RNA/DNA/PNA, definitions of life, characteristics and relics of the RNA world, catalytic RNA (ribozymes), the world of PNA, the world of DNA and proteins, the properties of the genetic code, the structure of the prokaryotic and eukaryotic cell, the oldest traces and evolution of life on Earth, the synthetic living cell, the search for life in the Universe

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
single-choice test	50.0%	100.0%

Recommended reading

Basic literature	S. Hawking, A Brief History of Time by Stephen Hawking, Bantam, 1998 R.F. Gesteland, The RNA World, Cold Spring Harbor Laboratory Press, 2005,
Supplementary literature	M. Yarus, Life from an RNA World: The Ancestor Within, Harvard Univ. Press, 2011
eResources addresses	

Example issues/ example questions/ tasks being completed

2. Obecny wiek Wszechświata oceniany jest na ok. (mld lat) a. 4-5.5 b. 8-10.5 c. 13.7-13.8 d. 19-20.1

Work placement

Not applicable

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