

Level: bachelor				
Course title: Exobiology				
Status: elective				
ECTS: 6				
Requirements:				
Learning objectives				
Using a scientific approach and scientific principles for creating students strict attitude regarding the questioning of existing definitions, attitudes and prejudices about life as a universal category and form.				
Learning outcomes				
After completing the course, students are expected to: demonstrate understanding of the basis of life on the Earth, and the possibility of its occurrence on the Earth and other celestial bodies; show willingness to solve tasks and problems related to the analysis of the current attitudes, goals and projects of the two world organizations for space research (NASA and ESA) in the field related to the possibility of life beyond the Earth, and the possibility of transmission of life from the Earth to other celestial bodies.				
Syllabus				
<i>Theoretical instruction</i>				
Definition, objectives, goals and role of exobiology. The importance of exobiology. NASA and ESA programmes. Main characteristics of the Earth as a celestial body in terms of creation and maintenance of life. What is life, where and when it was created. Origin of the living organisms on the Earth. Evolution of matter and the living organisms on the Earth. The reasons for extinction or reduction in population abundance of species or groups of species on Earth. Examples of extinct species. Epochs of mass extinctions. Paleobiology. Basic principles for the functioning of living systems on the Earth. Structure and function of DNA and RNA. Genetic code. The processes of replication, transcription and translation. Mutations. Extreme habitats on the Earth. Definition and classification of extremophiles. The importance of extremophiles. Physiological groups of extremophiles: cryophiles, halophiles, barophiles, osmophiles, acidophiles, alkaliphiles. Modifications of extremophiles: morphological, physiological, biochemical, environmental. Bacteria, archaeobacteria, and cyanobacteria -possible forms of life on other planets. Conditions for the existence of the living organisms on other solar system bodies. Mars. Terraforming of Mars. Satellites of Jupiter. Possibility of life on Europa and Titan. Cosmic-chemical evolution. Interstellar space and comets. Galactic habitable zone. Analysis of the likelihood of life in the Universe. Scientific methods of searching for traces of the life and living organisms (spectral analysis and paleoclimate reconstruction). The origin and evolution of the consciousness. SETI project. Current scientific projects and expeditions.				
<i>Practical instruction</i>				
Exercises.				
Weekly teaching load				Other:
Lectures: 3	Exercises: 1	Other forms of teaching: 1	Student research:	